

PATENTS FOR INVENTIONS.

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ABRIDGMENTS OF SPECIFICATIONS.

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CLASS 61,  
HAND TOOLS AND BENCHES  
FOR THE USE OF METAL, WOOD, AND  
STONE WORKERS.

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PERIOD—A.D. 1855-1866.

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LONDON:  
PRINTED FOR HIS MAJESTY'S STATIONERY OFFICE,  
By LOVE & MALCOMSON, LTD., 4 & 5, DEAN STREET, W.C.  
PUBLISHED AT THE PATENT OFFICE, 25, SOUTHAMPTON BUILDINGS,  
CHANCERY LANE, LONDON, W.C.

1905.

PRICE ONE SHILLING.

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## EXPLANATORY NOTE.

The contents of this Abridgment Class may be seen from its Subject-matter Index. For further information as to the classification of the subject-matter of inventions, reference should be made to the *Abridgment-Class and Index Key*, published at the Patent Office, 25, Southampton Buildings, Chancery Lane, W.C., price 1s., postage 6d.

It should be borne in mind that the abridgments are merely intended to serve as guides to the Specifications, which must themselves be consulted for the details of any particular invention. Printed Specifications, price 8d., may be purchased at the Patent Office, or ordered by post, no additional charge being made for postage.

## SUBJECT-MATTER INDEX.

Abridgments are printed in the chronological order of the Specifications to which they refer, and this index quotes only the year and number of each Specification.

### Adzes:

making by cutting and working metal. *See*  
*Abridgment Class Metals, Cutting &c.*

Angles, Tools for setting out. *See* Bevels and  
mitres; Tools for setting-out work.

### Augers, gimlets, and wood-boring bits.

'55. 722. 1275. 2529. '56. 1812. 2230. '58. 909.  
1885. 2023. 2341. '60. 1055. '61. 1864. '64.  
487. '65. 3290.

Excepting Hand tools, Combination, for metal  
&c. workers  
for which *see that heading*.

braces. *See* *Abridgment Class Metals, Cutting*  
&c.

handles, [including fixing]. *See* Hand-tool  
handles.

holders for tools for wood-cutting machines.  
*See* *Abridgment Class Wood &c.*

making by cutting and working metal. *See*  
*Abridgment Class Metals, Cutting &c.*

877

### Augers, Hollow, and spoke-trimmers.

'56. 2594. '57. 54. '59. 2955. '61. 1829.

machines for operating. *See* Wood and the  
like, Tenoning &c., [*Abridgment Class Wood*  
&c.].

Awls, Wood-boring. *See* Augers, gimlets, &c.

### Axes. '55. 2656. '59. 2423.

Excepting Picks and pick-axes;  
for which *see that heading*.

handles, [including fixing]. *See* Hand-tool  
handles.

making by cutting and working metal. *See*  
*Abridgment Class Metals, Cutting &c.*  
tempering. *See* *Abridgment Class Iron &c.*

Bed-keys. *See* Spanners &c.

**Benches, Work.** '50. 1632. 2260. '61. 2825.

**Bench fittings.** '59. 1632. '61. 123. '65. 2539.

Excepting Cramps and clamps, Joiners' and like; Vices;  
for which see those headings.

Bench screws or vices. See Vices.

**Bevels and mitres.** '65. 2613.

drawing and like squares. See *Abridgment Class Philosophical instruments.*

Bits and augers. See Augers, gimlets, &c.

Bolt-cutters. See Pipe and rod cutters.

Bolt-extractors. See Screw &c. extractors.

Boring-bits for wood. See Augers, gimlets, &c.

**Box-openers and similar prising-tools:**  
Excepting Nail and tack extractors;  
for which see that heading.

Brad-awls. See Augers, gimlets, &c.

Carpenters' benches. See Benches, Work.

Carpenters' planes. See Planes, Hand.

Caulking-tools. See Percussive hand tools, Pneumatic and like.

Centre bits. See Augers, gimlets, &c.

Chipping, Tools for. See Chisels; Percussive hand tools, Pneumatic and like; Picks and pick-axes.

**Chisels.** '55. 502. 1685. '57. 841. '60. 2805. '62. 1309. '66. 604. 2080.

Excepting Hand tools, Combination, for metal &c. workers; Metal-cutting machines, Tools &c. for, [*Abridgment Class Metals, Cutting &c.*]; Wood and the like cutting and working machines, Tools &c. for, [*Abridgment Class Wood &c.*];  
for which see those headings.

alloys for. See *Abridgment Class Metals and alloys.*

grinding and polishing. See *Abridgment Class Grinding or abrading &c.*

handles, [including fixing]. See *Hand-tool handles.*

making by cutting and working metal. See *Abridgment Class Metals, Cutting &c.*

tempering. See *Abridgment Class Metals and alloys.*

Choppers or axes. See Axes.

Clamps or cramps. See Cramps &c.

Clamps or vices. See Vices.

Cleavers or axes. See Axes.

Combination hand tools. See *Hand tools Combination, for metal &c. workers.*

**Cramps and clamps, Joiners' and like.**

'55. 72. 2932. '56. 2567. '57. 62. 151. 272. 1421. 2337. '58. 1181. '60. 1472. 2857. 3129. '61. 1509. 1965. 2461. 2583. '62. 489. 1246. '64. 1466. '66. 603. 918.

Cramps or vices. See Vices.

**Crowbars:**

Excepting Railway and tramway vehicles, (shunting-levers and the like for), [*Abridgment Class Railway &c. vehicles*];  
for which see that heading.

Cutters or pliers. See Pliers &c.

**Diamond and like tools.** '61. 2107. '62. 118.

Excepting Saws;  
for which see that heading.

Dies and stocks. See Taps, stocks, and dies.

Drawing-knives, Carpenters'. See Spokeshaves &c.

Drawing or extracting screws, bolts, and rivets.  
See Screw &c. extractors.

Extractors, Nail and tack. See Nail &c. extractors.

**File and rasp cutting machines.** '55.

961. '56. 162. 2080. '57. 1740. 2161. 2795. '58. 815. 1893. 2719. '59. 205. 1607. 2741. '60. 1500. 1571. '61. 833. '62. 2492. 2494. 3419. '63. 119. 1218. 2385. '64. 1290. 2221. 2355. '65. 412. 885. 1013. 1093. 1172. 1792. 3165. '66. 288. 1507. 1596. 1715. 1992. 2385. 2490. 2548. 2549. 2944.

**Files and rasps.** '55. 742. '58. 880. '59. 205. 1941. '60. 1448. 2261. '61. 1753. '62. 2941. 3293. '63. 1010. '64. 565. 1645. '65. 412. 2887. '66. 1987.

Excepting Nail files, cutters, and cleaners, [*Abridgment Class Toilet &c.*];  
for which see that heading.

annealing. See *Abridgment Class Iron &c. cutting-machines.* See *File and rasp cutting machines.*

grinding and sharpening. See *Abridgment Class Grinding or abrading &c.*



**Files and rasps—cont.**

- handles, [including fixing]. See Hand-tool handles.  
 making, [other than cutting]. See Abridgment Class Metals, Cutting &c.  
 tempering. See Abridgment Class Iron &c.

Flooring-cramps. See Cramps &c.

Forging-tongs. See Pliers &c.

Gimlets. See Augers, gimlets, &c.

**Gouges.** '57. 841.

- leather-cutting hand tools. See Abridgment Class Cutting &c.  
 making by cutting and working metal. See Abridgment Class Metals, Cutting &c.

Grippers or holding-tools. See Pliers &c.

**Hammers, Hand.** '62. 1097. '63. 2086.

- Excepting Hand tools, Combination, for metal &c. workers;  
 for which see that heading.  
 alloys for. See Abridgment Class Metals and alloys.  
 handles, [including fixing]. See Hand-tool handles.  
 making by cutting and working metal. See Abridgment Class Metals, Cutting &c.

Handles, Hand-tool. See Hand-tool handles.

Handles of unspecified application. See Hand-tool handles.

Hand-saws. See Saws.

**Hand-tool handles:**

- Excepting handles for Ironing machines and appliances, Laundry &c., [Abridgment Class Washing &c.]; Planes, Hand; Spanners and wrenches; Vices;

for which see those headings.

attaching. See fixing below.

bent or inclined. '56. 2958.

D-type. '62. 1664. '65. 1798. '66. 761. 3315.

ferrules, attaching. '63. 895.

fixing. '55. 434. 502. '58. 169. 1320. '59. 2423.

'60. 644. 1212. 1648. 2805. '61. 1864. '63.

363. 895. 2086. '64. 1295. 2449. '65. 2671.

2735. 2796. '66. 761. 2921.

for—

augers, gimlets, and wood-boring bits. '55.

1922. '56. 2230. '58. 1320. '61. 1864.

axes. '59. 2423. '60. 644.

brad-awls. See augers, gimlets, &c. above.

chisels. '55. 502. '60. 1212. 2805. '63. 895.

cultivators. '56. 2958.

files and rasps. '60. 1212. '63. 895.

forks, agricultural and like. '62. 1664. '66.

761.

**Hand-tool handles—cont.**

for—cont.

gimlets. See augers, gimlets, &c. above.

hammers, hand. '58. 169. '60. 89. '63. 363. 2086.

hand-tools, combination, for metal, stone, and wood workers. '57. 2509. '60. 1648.

hoes, hand. '56. 2958. '58. 169.

knives, butchers'. '59. 2423.

knives, pocket, pen, toilet, and like. '64. 2580.

mallets. '60. 89. '63. 363.

mattocks. See picks &c. below.

nailing, hand tools for. '58. 1320.

picks and pick-axes. '58. 169. '60. 89. 644.

'63. 363. '65. 2796.

putty-knives and other puttying-tools. '65. 2671.

screwdrivers. '56. 2230.

spades, shovels, and scoops. '55. 434. '62. 1664. '64. 2449. '66. 761. 985. 3315.

turf-cutting, tools for. '56. 2958.

weeds, destroying, tools for. '56. 2958.

wood-boring bits. See augers, gimlets, &c. above.

hollow to contain tools or other articles. '57. 2509. '58. 1320. '60. 1648.

in one piece with metal of head. '66. 761.

making. See Metal, Cutting &c., [Abridgment Class Metals, Cutting &c.]; Moulding plastic &c. substances, [Abridgment Class Moulding &c.]; Wood and the like, Cutting and working, [Abridgment Class Wood &c.].

materials. '55. 187. '56. 656. '59. 496. '61.

2482. '63. 905. '64. 2580. '65. 993. '66. 985.

metal. '55. 1922. '60. 89. '65. 993. 1798. '66. 761.

open framework. '65. 993.

rotating. '56. 2230.

shields for. '66. 3315.

sockets for. '55. 434. '58. 1320. '60. 644. 2805.

'64. 2449. '65. 2796. '66. 761.

strengthened wooden rods for. '63. 363.

taugs. See fixing above.

**Hand tools, Combination, for metal, stone, and wood workers:**

augers, gimlets, and wood-boring bits. '55. 1685.

awls for sewing. '66. 1995.

boots and shoes, making, tools for. '66. 1995.

boring drills and cutters. '66. 257.

braces and other hand-drills. '60. 1094. '64.

1164. '65. 2212.

chisels. '55. 1685.

drill braces. '64. 2731.

gauges. '63. 2323.

hammers, hand. '61. 2310. '62. 1097. '66. 1995.

2247.

handles, [including fixing]. See Hand-tool handles.

holding and picking-up tools, hand. '63. 1155.

levels and plumbing-instruments. '60. 1648.

mallets. '59. 645.

measures of length. '57. 2509. '60. 1648.

nail and tack extractors. '62. 1097. '63. 994.

1155. '65. 2212.

nailing, hand tools for. '63. 1155.

**Hand tools, Combination, &c.—cont.**

pipe and rod cutters. '55. 1035. '60. 869. '64. 636. '65. 1311. 1411. 1527. 2212. 3036. '66. 68. 506. 2552.  
 pipe and rod trimmers. '65. 1311. '66. 506. 2552.  
 pliers, cutters, and pincers. '63. 994. 2323. '66. 257. 1995.  
 rulers, drawing and like. '60. 1648.  
 saws. '57. 2509. '60. 1648.  
 screwdrivers. '61. 2310. '64. 2731.  
 spanners and wrenches. '59. 645. '61. 2310. '63. 994. '64. 636. '65. 3036. '66. 68. 2247.  
 squares, drawing and like. '57. 2509. '60. 1648.  
 taps, stocks, and dies. '55. 1035. '60. 869. 1094. '64. 1164. '65. 1311. 1411. 1527. 2212.  
 tools for setting-out work. '60. 1648. '66. 257.  
 wire cutters. *See* pliers &c. above.  
 wire gauges. *See* gauges above.  
 wrenches. *See* spanners &c. above.

Hatchets. *See* Axes.

**Holding and picking-up tools, Hand,**  
[other than Pliers and pincers]. '57. 1253. '63. 1155.

*Excepting* Hand-tools, Combination, for metal &c. workers; Spanners and wrenches; Vices; *for which see those headings.*

Joiners' cramps. *See* Cramps and clamps, Joiners' &c.

Keys or spanners. *See* Spanners &c.

Knives, Putty. *See* Putty knives &c.

**Mallets:**

*Excepting* Croquet, (mallets for), [Abridgment Class Toys &c.]; Hand tools, Combination, for metal &c. workers; Ropes and cords, (serving-mallets for), [Abridgment Class Ropes &c.]; *for which see those headings.*  
 handles, [including fixing]. *See* Hand-tool handles.

Marking-gauges. *See* Tools for setting-out work.

Mattocks. *See* Picks &c.

Mitre cramps. *See* Cramps and clamps, Joiners' &c.

**Nail and tack extractors.** '58. 71.

*Excepting* Hand tools, Combination, for metal &c. workers; *for which see that heading.*

**Nailing, Hand tools for,** [other than Hammers]. '58. 1320. '62. 1609. '63. 1155.

*Excepting* Boots and Shoes, Making, [Abridgment Class Boots &c.]; Hand tools, Combination, for metal &c. workers; *for which see those headings.*  
 cramps and clamps, joiners' and like. *See* Cramps and clamps, Joiners' &c.  
 handles, [including fixing]. *See* Hand-tool handles.

Nippers. *See* Pliers &c.

Patterns or templets. *See* Gauges, [Abridgment Class Registering &c.]; Tools for setting-out work.

**Percussive hand tools, Pneumatic and like.** '63. 1095. '65. 982. 1778. '66. 604. 2954.**Picks and pick-axes.** '62. 1309. '65. 2796. '66. 2973.

handles, [including fixing]. *See* Hand-tool handles.  
 making by cutting and working metal. *See* Abridgment Class Metals, Cutting &c.

Pincers. *See* Pliers &c.

**Pipe and rod cutters,** [including only Hand tools]. '55. 16. 1035. '57. 931. '61. 2868. '63. 130. '64. 3213. '65. 85. 1311. 1411. 1527. 3214. '66. 2395. 2552. 2840. 3105.  
*Excepting* Hand tools, Combination, for metal &c. workers; *for which see that heading.*

**Pipe and rod trimmers,** [including only Hand tools]. '57. 931. '65. 1311. 3214. '66. 2552.

*Excepting* Hand tools, Combination, for metal &c. workers; *for which see that heading.*

Pipe tongs. *See* Pliers &c.

Pipe vices. *See* Vices.

Pipe wrenches. *See* Spanners &c.

**Planes, Hand.** '55. 1327. 1958. '56. 819. 1691. '57. 151. 1733. '59. 115. 946. 1439. '60. 2805. '61. 546. '62. 1682. 1818. '65. 2577. '66. 973.

*Excepting* Boots and shoes, Making, (paring-tools), [Abridgment Class Boots &c.]; Metals, Planing &c., (hand-apparatus), [Abridgment Class Metals, Cutting &c.]; *for which see those headings.*

grinding and polishing. *See* Abridgment Class Grinding or abrading &c.

hardening or tempering. *See* Abridgment Class Iron &c.

**Planes, Hand—cont.**

making parts. See Metal, Cutting &c., [Abridgment Class Metals, Cutting &c.].  
spokeshaves and like tools. See Spokeshaves &c.

**Pliers, cutters, and pincers,** [including like holding and cutting tools]. '55. 146. 211. 425. 1035. '56. 204. '57. 2562. '58. 441. 817. 1111. 1537. '60. 20. 198. '62. 250. 996. 2732. '63. 403. '66. 1904.

Excepting Buttons, (pliers for setting), [Abridgment Class Fastenings, Dress]; Cooking and kitchen apparatus &c., (tongs, cooking), [Abridgment Class Cooking &c.]; Crucible tongs, [Abridgment Class Metals, Cutting &c.]; Dental instruments, [Abridgment Class Medicine &c.]; Eyeletting, (pliers for), [Abridgment Class Fastenings, Dress]; Forceps, Surgical, [Abridgment Class Medicine &c.]; Glass, Manufacture of, (pliers used in), [Abridgment Class Glass]; Hand tools, Combination, for metal &c. workers; Holding and picking-up tools, Hand, [other than Pliers and pincers]; Hot plates &c., Appliances for handling, [Abridgment Class Cooking &c.]; Lacing-fastenings, (pliers for setting), [Abridgment Class Fastenings, Dress]; Metals, Drawing, (gripping-jaws), [Abridgment Class Metals, Cutting &c.]; Mincing, (cutters for), [Abridgment Class Cooking &c.]; Punching-pliers; Reachers or long-arms, [Abridgment Class Shop &c. accessories]; Saws, Sharpening and setting, (pliers for); Seals and sealing, (pliers for), [Abridgment Class Writing-instruments &c.]; Spanners and wrenches; Stopper-keys &c., [Abridgment Class Stoppering &c.]; Tongs, Table, [Abridgment Class Table articles &c.];  
for which see those headings.

Plough planes. See Planes, Hand.

Pneumatic percussive hand tools. See Percussive hand tools, Pneumatic &c.

**Punching-pliers.** '58. 2046. '59. 2529. '62. 2732. '66. 1097.

Excepting Fares and admission-fees, Registering &c., (ticket clips and punches), [Abridgment Class Registering &c.];  
for which see that heading.

**Putty knives and other puttying-tools.** '65. 2671.

Rasps. See Files &c.

Rods, Cutting metal. See Pipe and rod cutters.

Rod trimmers. See Pipe and rod trimmers.

**Saws.** '55. 326. '56. 411. '61. 1829. '64. 3072. '66. 2170. 2365.

Excepting Hand tools, Combination, for metal &c. workers; Spinning yarns &c., (saws for gins), [Abridgment Class Spinning]; Trephining-appliances, [Abridgment Class Medicine &c.];  
for which see those headings.  
grinding and polishing. See Abridgment Class Grinding or abrading &c.  
handles, [including fixing]. See Hand-tool handles.  
machine saws. See Abridgment Class Metals, cutting &c.  
making by cutting and working metal. See Abridgment Class Metals, Cutting &c.  
sharpening and setting. See Saws, Sharpening &c.  
tempering. See Abridgment Class Iron &c.  
tree-felling. See Abridgment Class Wood &c.

**Saws, Sharpening and setting.** '56. 411. 502. 715. '57. 734. '58. 1032. '60. 2275. '63. 1194. '64. 1062, [Appendix, page 73]. 1724. 2793. '65. 640. '66. 1943. 1984.  
files. See Files &c.  
vices. See Vices.**Scrapers, Metal-working.** '64. 1645.**Screw, bolt, and rivet extractors,** [including only Hand tools]. '61. 875.

Excepting Screwdrivers; Spanners and wrenches;  
for which see those headings.

**Screwdrivers.** '57. 2935. '62. 1904. '64. 2731. '65. 1387.

Excepting Hand tools, Combination, for metal &c. workers; Wood-screws, (machines for inserting), [Abridgment Class Nails &c.];  
for which see those headings.  
handles, [including fixing]. See Hand-tool handles.  
making by cutting and working metal. See Abridgment Class Metals, Cutting &c.  
spanners and wrenches. See Spanners &c.

Screwing, Taps, stocks and dies for. See Taps, stocks, and dies.

Screw-keys or spanners. See Spanners &c.

Sealing-pliers. See Pliers &c.

Setting saws. See Saws, Sharpening &c.

Sharpening saws. See Saws, Sharpening &c.

Shaving or trimming pipes and rods. See Pipe and rod trimmers.

Smoothing or trimming pipes and rods. *See* Pipe and rod trimmers.

**Spanners and wrenches.** '55. 830. 1035. 2162. '56. 1298. 1585. 2222. '57. 2791. '59. 373. 442. 654. 2904. '60. 198. 1221. 1573. 1863. 2638. 3195. '61. 1718. 2248. 2583. '62. 41. 250. 1954. 2196. 3338. '63. 987. 994. 2340. 2524. '64. 1256. 1747. 2054. 2077. 2283. 2395. '65. 86. 457. 1250. 2396. 2783. '66. 337. 391. 697.

*Excepting* Hand tools, Combination, for metal &c. workers;  
for which *see* that heading.

making by cutting and working metal. *See* *Abridgment Class Metals, Cutting &c.*

**Spokeshaves and like tools.** '55. 2656. '56. 2657. '64. 2198.

Stocks and dies. *See* Taps, stocks, and dies.

**Taps, stocks, and dies.** '55. 1035. '56. 8. '57. 239. '58. 1318. '59. 834. '60. 1110. 2536. '61. 2154. 2524. '62. 2703. '63. 404. 1041. '64. 347. 2439. '65. 257. 565. 1411. 1527. '66. 1765. 2079. 2840.

*Excepting* Hand tools, Combination, for metal &c. workers;  
for which *see* that heading.

making by cutting and working metal. *See* *Abridgment Class Metals, Cutting &c.*

Templets. *See* Gauges, [*Abridgment Class Registering &c.*]; Tools for setting-out work.

Tenon saws. *See* Saws.

Tongs or holding-tools. *See* Pliers &c.

Tongs, Pipe. *See* Pliers &c.

Tools, Alloys for. *See* *Abridgment Class Metals and alloys.*

**Tools for setting-out work.** '55. 925. '56. 2053. 2717. '57. 2337. 2079. '58. 2518. '61. 346. 763. '63. 2014. '66. 445.

*Excepting* Bevels &c.; Clinometers &c., [*Abridgment Class Philosophical instruments*]; Hand tools, Combination, for metal &c. workers; Levels and plumbing-instru-

**Tools for setting-out work—cont.**

*Excepting—cont.*

ments, [*Abridgment Class Philosophical instruments*]; Sewing, [*Abridgment Class Sewing &c.*]; Squares, Drawing and like, [*Abridgment Class Philosophical instruments*];

for which *see* those headings.

Tools, Making by cutting and working metal. *See* *Abridgment Class Metals, Cutting &c.*

**Trowels and wall-pointing tools, Bricklayers' and like:**

making by cutting and working metal. *See* *Abridgment Class Metals, Cutting &c.*

Tube cutters. *See* Pipe and rod cutters.

Tube vices. *See* Vices.

Turnscrews or screwdrivers. *See* Screwdrivers.

Tweezers. *See* Pliers &c.

**Vices.** '55. 425. 1231. 1596. 2110. 2130. 2805. '56. 204. 742. 1513. 2974. '57. 1361. 1493. 1888. '59. 1632. 1643. 1977. '60. 20. 1221. 1475. 3002. '61. 623. 1323. 2294. '62. 855. 1155. 2620. '64. 1070. 1724. 2042. '65. 18. 90. 1472. 1761. '66. 337. 457. 649. 836. 1574. 3174.

*Excepting* vices for machine tools, for which *see* special headings, such as Metal cutting and working machine details, [*Abridgment Class Metals, Cutting &c.*].

Vices or cramps. *See* Cramps and clamps, Joiners' &c.

Wire-cutters. *See* Pliers &c.

Wood-boring bits. *See* Augers, gimlets, &c.

Work-benches. *See* Benches, Work.

Wrenches and spanners. *See* Spanners &c.

Wrenches or pliers *See* Pliers &c.



## NAME INDEX.

The names in *italics* are those of persons by whom inventions have been communicated to the applicants for Letters Patent.

Abeillon, G. ....'59. 946  
Adkins, W. ....'64. 1256  
.....'66. 1765  
Agnew, T. ....'64. 1466  
Ahsbohs, J. ....'60. 1475  
Alcan, E. ....'63. 2323  
Alcan, G. ....'63. 2323  
Aldis, E. ....'57. 1421  
Allcard, J. H. ....'62. 855  
Alley, S. ....'64. 2395  
Amott, G. R. B. ....'60. 2805  
Anden, W. van. ....'61. 833  
.....'65. 1792  
Andrews, A. ....'62. 2941  
Aston, J. W. ....'61. 623  
Avery, J. ....'55. 1922  
Ayres, J. A. ....'65. 1387

Badge, R. J. ....'58. 71  
Badin, J. ....'58. 441  
Bakewell, F. C. ....'55. 1327  
Banks, T. ....'60. 198  
Baragwanath, H. H. ....'65. 3036  
Baragwanath, J. P. ....'65. 3036  
Barber, D. H. ....'66. 1995  
Barbour, J. ....'62. 1097  
Barlow, N. ....'56. 411  
Barracough, T. C. ....'63. 130  
.....'64. 487  
Bayley, R. ....'66. 2079  
Baylis, W. ....'63. 403  
Bedford, J. ....'62. 1818  
Bentall, E. H. ....'66. 1943  
Bentley, W. H. ....'55. 2529  
Bernard, J. ....'56. 2657  
Bewley, R. ....'63. 2524  
Birdsall, D. ....'64. 347  
Bishop, W. ....'58. 880  
Black, R. M. ....'64. 2077  
Blanchard, A. V. ....'62. 1664  
" F. ....'62. 1664  
" J. D. ....'62. 1664  
Blanchon, E. ....'56. 2717  
Bleckmann, H. A. ....'55. 1958  
Blyth, F. D. ....'61. 1864

Bond, R. ....'59. 2741  
Bordas, E. O. ....'57. 2935  
Bourcy, J. S. ....'61. 2310  
Bourquin, C. ....'65. 2396  
Bousfield, G. T. ....'55. 1685  
.....'56. 819. '62. 2492. 2494  
.....'63. 119. 1218. '64. 1290  
.....'65. 3165. '66. 1507.  
Brainard, A. H. ....'66. 457  
Bray, W. ....'66. 1992  
Breflit, E. ....'61. 2461  
Broadwell, L. W. ....'61. 763  
Brodie, J. ....'55. 425  
Brookes, W. ....'65. 885  
Brooman, R. A. ....'56. 1812  
.....'57. 1888. '61. 2310. '63.  
.....2086.  
Brown, J. ....'58. 1111  
Buckingham, J. ....'65. 2783  
Burley, R. ....'60. 89  
.....'63. 363  
Burt, H. P. ....'59. 373

Caldicott, T. F. ....'57. 1733  
Carle, J. F. C. ....'66. 918  
Carter, C. P. ....'62. 996  
" O. ....'56. 715  
Chacot, P. A. ....'64. 2355  
Chadwick, J. ....'57. 3079  
Chamberlain, A. P. ....'59. 1941  
Chambers, A. ....'65. 3165  
.....'66. 1507  
Chandler, H. ....'66. 697  
Chartiez, J. ....'65. 85. 86  
Chatwin, T. ....'58. 1318  
.....'66. 2840  
Cheadle, G. ....'58. 1181  
Childs, A. B. ....'61. 2107  
Childs, D. M. ....'61. 2107  
Churchill, C. ....'65. 2783  
Clark, W. ....'58. 1032  
.....'60. 1055. 1571. 3002. '62.  
.....250. '65. 457. 1792.  
" W. A. ....'58. 909  
Clarke, J. A. ....'59. 2529

Clarke, J. I. ....'55. 140  
Clavel, C. A. ....'63. 1011  
Clegg, R. D. ....'58. 2346  
Cleminson, W. ....'63. 2340  
Clerk, F. N. ....'59. 2423  
Cohen, B. S. ....'56. 656  
Colomb, G. ....'63. 905  
Comer, H. ....'66. 2944  
Communay, J. O. ....'64. 2449  
Cooke, J. C. ....'60. 1571  
Corner, J. ....'58. 2518  
Coulouvrat, G. ....'60. 1055  
Coulter, W. ....'61. 123  
Cowell, L. ....'58. 817  
Cox, G. ....'61. 1509  
Craddock, T. ....'57. 931  
Crane, M. G. ....'65. 412  
Cuppers, G. ....'65. 1093

Dähne, F. W. ....'66. 2973  
Dalgety, A. ....'56. 204  
Dalthöf, J. B. ....'62. 3419  
.....'66. 288  
Davidson, W. ....'60. 869  
Davies, E. ....'64. 2439  
.....'65. 2212  
" G. ....'61. 546  
Davis, D. ....'55. 2805  
" R. W. ....'55. 2805  
" W. ....'58. 1320  
Delong, H. ....'66. 2365  
Dickinson, J. ....'62. 118  
Disston, H. ....'60. 1648  
Dixon, A. ....'60. 1110  
Dodd, T. H. ....'59. 2260  
Dodge, J. ....'65. 1172. 2548  
.....'66. 2385  
Doelling, G. L. ....'57. 239  
Dory, F. ....'58. 441  
Droop, J. C. ....'63. 1155  
Drury, E. ....'59. 1977  
" R. F. ....'59. 1977  
Dufrené, H. A. ....'65. 2396  
Duppa, T. D. ....'59. 1632

Eades, W.....'60. 2536. 3195  
 Easterbrook, J.....'62. 855  
 Eden, F. M. ....'66. 604  
 Ehrhardt, L. H. G.....'65. 1761  
 Emerson, J. E.....'60. 644  
 Emery, G. W.....'63. 1194  
 Emery, H. L. ....'63. 1194  
 Exall, W. ....'56. 502

Ferrabee, J.....'59. 2904  
 Flamm, P.....'66. 2170  
 Fontaine-Moreau, P. A., Comte  
 de, ..... '55. 211. '64. 2355  
 Fortune, N. ....'57. 151  
 Foster, W. ....'65. 257  
 Fuller, J. H. ....'55. 1035  
 '59. 834. '60. 869  
 Furness, W.....'66. 1992

Garaboux, A. ....'64. 2449  
 Gauchez, L. ....'63. 2323  
 Gedge, W. E.....'65. 85  
 '86. '66. 2080. 2170  
 Genon, A. ....'60. 1055  
 Gent, G. ....'55. 16  
 Ghislin, T. G.....'61. 2482  
 Gilbert, F. S.....'64. 2731  
 " F. W.....'64. 2580  
 " W.....'64. 2580  
 Glover, W. H.....'61. 2294  
 Gorham, J. ....'57. 2509  
 Grafton, H.....'64. 2198  
 Grainger, J. ....'64. 1645  
 Gray, G. ....'59. 442  
 " J. M.....'63. 1095  
 Green, A. ....'61. 2294  
 Griffin, M. P.....'66. 2490  
 Grimshaw, W. D. ....'66. 68  
 Grist, J.....'55. 2932. '59. 115

Hadfield, G.....'60. 3129  
 Harcourt, D. ....'57. 2791  
 Hart, J. T. ....'56. 2053  
 Hayhurst, W.....'59. 2741  
 Heap, J.....'62. 2703. '63. 987  
 " W.....'61. 2868  
 Henderson, C.....'60. 1472  
 Henry, W. A.....'55. 1231  
 Henshall, J.....'66. 1715  
 Hespenheide, W.....'66. 2944  
 Hewett, G.....'66. 985  
 Heydon, J. ....'65. 2539  
 Hick, J. ....'66. 609  
 Hill, H. C. ....'57. 62  
 Hodgson, G.....'64. 2042. '65. 18  
 Holmes, J. ....'66. 1097  
 Hopper, W. S.....'55. 1327  
 Hopwood, T. H.....'63. 403  
 Howell, J.....'63. 347  
 Hunt, E. ....'60. 2275  
 Hurst, C. H.....'59. 645  
 Hutchins, E. F.....'59. 1643  
 Hyde, J. ....'57. 1361

Hyde, J.....'59. 442  
 Hyde, W.....'57. 1361

Ibbotson, A. B. ....'60. 1221  
 Imbert, L. A. ....'57. 2337  
 Incorporated Washoe Tool Co.  
 '65. 2796  
 Isaacs, D. van G.....'66. 1574

Johnson, A. F. ....'66. 2490  
 " J. H.....'57. 2509  
 '66. 1995. 2365. 2921  
 2944.  
 " W.....'65. 1472  
 Jones, J. G.....'65. 982  
 Jonquet, D. ....'55. 2656  
 Jordan, C.....'64. 565

Kaye, C.....'58. 169  
 " W. ....'58. 169  
 Kendall, W.....'55. 16  
 Kennedy, J. ....'55. 502  
 Kerr, R. ....'55. 326  
 Kiesling, C. L. ....'62. 3293  
 " J. A. ....'62. 3293  
 Klein, J. L. E.....'60. 20  
 Knight, J. A.....'62. 118  
 Kunstmann, R.....'65. 565

Laeroix, P. L. T.....'56. 162  
 Lake, W. R. ....'66. 457. 2548  
 2549  
 Lassus, J. B. O.....'65. 2887  
 Lees, J. P. ....'57. 2562  
 Limet, P. H. ....'66. 1596  
 Lishman, M. H.....'63. 2014  
 Low, G.....'65. 1778  
 " R.....'57. 1493  
 Lyon, W.....'66. 1574

McAndrew, A. ....'66. 1574  
 McGrah, T.....'65. 2671  
 McGregor, W. ....'58. 815. 1893  
 Machin, T. ....'65. 2577  
 Mackintosh, W. ....'66. 337  
 McNally, E. ....'65. 1411  
 Marchinton, J. M.....'55. 2130  
 Mareschal, J.....'60. 3002  
 Marshall, G.....'57. 734  
 Martin, J. ....'65. 3290  
 Maryon, W.....'59. 2955  
 Matthews, S. P.....'62. 1155  
 Mears, W.....'61. 1864  
 Mehrel, E. ....'56. 1691  
 Mennons, M. A. F. ....'60. 1212  
 Merritt, B. ....'64. 487  
 Meyer, J. C.....'56. 742  
 Micolon, H.....'63. 2086  
 Miller, J.....'66. 2247

Mills, B. J. B.....'66. 3174  
 Millward, R. ....'56. 1585  
 Moat, F. ....'55. 146  
 Montagu, S.....'57. 272  
 Moreau, P. A., Comte de Fon-  
 taine-... '55. 211. '64. 2355  
 Morgan, J. ....'66. 1904  
 Morris, R. ....'66. 1984  
 Moseley, T. B. ....'57. 1253  
 Mountford, G.....'65. 1311  
 Müller, G.....'66. 973  
 Myring, C. ....'60. 2857

Neullies, —.....'57. 1888  
 Newbery, W. B. ....'65. 412  
 New England Vice Co. ....'66.  
 3174  
 Newington, S.....'56. 2958  
 Newton, A. V. ....'55. 961  
 '56. 2080. 2230. 2974. '64.  
 347. 1070. '65. 1387. 3214  
 " W. E. ....'55. 722. 1275  
 '1596. '57. 1740. 2161. 2795  
 '59. 205. '60. 644. 2261  
 '61. 833. 875. '62. 1664  
 '63. 994. 1010. '65. 2796  
 '66. 1574. 2247.  
 Nicholls, A. ....'65. 2613  
 Nichols, D. M.....'65. 3214  
 Nicholson, W. T. ....'64. 1290  
 Nimmo, G. ....'66. 3315  
 Normandy, L. A. ....'58. 2719

Ommanney, F. F. ....'66. 2954  
 O'Neill, P. B. ....'61. 2248. '62.  
 41. 1954  
 O'Reilly, F. ....'61. 2825  
 Ormerod, E. ....'62. 1309  
 Orvis, J. ....'65. 2735

Paillard, A. ....'60. 1212  
 Parker, C. H. ....'66. 836  
 Parkes, T. ....'66. 2395  
 Parnacott, E. J. W.....'64. 1062,  
 [Appendix, page 73]. 2793  
 Parry, J. ....'66. 1984  
 Peace, J. ....'61. 2154  
 Peillard, C. J. B. ....'66. 2080  
 Pendlebury, J. T. ....'66. 556  
 " T. ....'66. 2502  
 Penrose, R.....'61. 2154  
 Philippson, F. C. ....'59. 1607  
 Pierce, W. P. ....'60. 2261  
 '62. 2492. 2494. '63. 119  
 1218.  
 Pilbeam, A. ....'58. 1885  
 Pitcher, G. W. ....'64. 1747  
 Pitman, J. T. ....'55. 2162  
 Pitt, J. ....'65. 18  
 Potter, E. O. ....'64. 2221  
 Pougnaire, C.....'61. 2310  
 Powers, H. ....'55. 742  
 Powers, H. ....'60. 1221

- Prale, T. A.* ..... '60. 2275  
*Press, W.* ..... '57. 1493  
*Preston, F.* ..... '58. 815. 1893  
     '60. 1500. '63. 2385  
*Price, W.* ..... '61. 1829
- Ransome, J. A.* ..... '62. 1609  
*Rawlings, T.* ..... '64. 636  
*Read, H.* ..... '64. 1747  
*Reddie, J.* ..... '55. 434  
*Richards, R.* ..... '64. 2283  
*Risse, F. J.* ..... '63. 895  
*Roberts, J.* ..... '60. 1863  
     " *W.* ..... '61. 1323  
     '65. 1250  
*Robertson, A.* ..... '55. 72  
*Robinson, J.* ..... '64. 1724  
*Roe, J.* ..... '66. 391  
     " *R.* ..... '62. 1682  
*Roger, J. P.* ..... '60. 20  
*Rogers, W. R.* ..... '61. 1965  
*Rooper, G.* ..... '64. 3072  
*Rose, S.* ..... '66. 2944  
*Ross, P.* ..... '64. 1295  
*Rossell, H.* ..... '66. 836  
*Routledge, W.* ..... '66. 2954  
*Roux, F. L.* ..... '66. 257  
*Russell, J. J.* ..... '61. 2524  
     " *S.* ..... '50. 496
- Samuel, B.* ..... '55. 187  
*Samuel, P. A.* ..... '62. 250  
     '65. 457  
*Sanborn, G. H.* ..... '63. 130  
*Schell, J.* ..... '62. 1818  
*Schiele, C.* ..... '62. 1309  
*Schofield, S.* ..... '62. 2732  
     " *W.* ..... '62. 2732  
*Schwartzkopf, L.* ..... '59. 1607  
*Schwartzkopf, L.* ..... '63. 994  
*Scullfort, G. I.* ..... '55. 830  
*Shanks, A.* ..... '56. 8. 1513  
*Sheldon, T.* ..... '65. 1798  
*Slack, J. C. H.* ..... '66. 1607
- Smith, R.* ..... '58. 1537  
*Somerville, T.* ..... '66. 3105  
*Spear, J.* ..... '66. 649  
*Spence, W.* ..... '60. 1448  
     '61. 763  
*Standly, R. W.* ..... '64. 3072  
*Stansbury, C. F.* ..... '55. 1958  
*Stephens, A.* ..... '64. 1070  
*Stone, E.* ..... '60. 1475  
*Stoneham, J.* ..... '57. 2562  
*Stroud, J. T.* ..... '63. 1041  
*Swift, F.* ..... '64. 2054
- Talabot, J.* ..... '66. 1987  
*Taunton, R. H.* ..... '65. 2212  
*Taylor, C.* ..... '58. 1318  
     '65. 1527  
     " *J.* ..... '59. 1439  
*Taylor, J.* ..... '66. 337  
*Taylor, W. R.* ..... '60. 985  
*Tempest, R.* ..... '65. 90  
*Thiercelin, E. E.* ..... '66. 2921  
*Thoma, J.* ..... '62. 2196  
*Thomas, C.* ..... '59. 2123  
     " *D.* ..... '66. 2973  
*Thomas, N.* ..... '66. 3105  
*Thompson, N.* ..... '61. 346  
     '62. 1904  
*Thomson, W.* ..... '62. 1097  
*Thomson, W. R. M.* ..... '66. 3105  
*Thorold, E.* ..... '62. 3338  
*Towle, H.* ..... '61. 875  
*Trattles, M.* ..... '57. 54  
*Tucker, W.* ..... '58. 2023  
*Turton, T.* ..... '65. 1013
- Upward, A.* ..... '60. 1094  
     '64. 1164  
*Urion, L.* ..... '56. 2594
- Vanderburgh, G. E.* ..... '60. 1448  
*Vasserot, C. F.* ..... '58. 441
- Vendrand, J.* ..... '61. 546  
*Verrie, A. T. O. de.* ..... '62. 250  
*Victory, J. J.* ..... '55. 925  
*Vogl, M.* ..... '65. 1093
- Walenn, W. H.* ..... '56. 411  
*Waller, R.* ..... '62. 489  
*Wann, S.* ..... '66. 1574  
*Warren, W.* ..... '55. 2110  
*Washoe Tool Co. Incorporated*  
     '65. 2796  
*Webster, W.* ..... '64. 636  
*Weed, A.* ..... '65. 885. '66. 2548  
     2549  
*Weigmann, G.* ..... '65. 565  
*Wells, G. M.* ..... '66. 1995  
*Wells, H. F.* ..... '62. 1246  
*Weston, M.* ..... '56. 715  
     " *W. T.* ..... '61. 2583  
*Whipple, M. D.* ..... '59. 205  
*White, T.* ..... '65. 993  
*Whitehouse, J.* ..... '60. 1573  
*Wilkinson, W.* ..... '61. 1753  
*Williams, T.* ..... '55. 1035  
     '59. 834  
*Wilson, J.* ..... '56. 2222  
     " *J. W.* ..... '57. 841  
     " *T.* ..... '56. 1298. '60. 2638  
     '61. 1718  
*Wimshurst, H. W.* ..... '65. 640  
*Wisker, M. van.* ..... '65. 3036  
*Wolstenholme, J.* ..... '64. 3213  
     '66. 506. 2552  
*Wood, W.* ..... '63. 404  
*Wootton, C.* ..... '56. 2222  
*Worroll, E.* ..... '65. 1311  
*Worstenholm, G.* ..... '60. 2536  
*Wright, J.* ..... '58. 2046  
     " *P.* ..... '62. 2620  
*Wyley, A.* ..... '64. 1645
- Yates, J. W.* ..... '66. 761  
*Young, J.* ..... '56. 2567  
     " *W.* ..... '66. 445

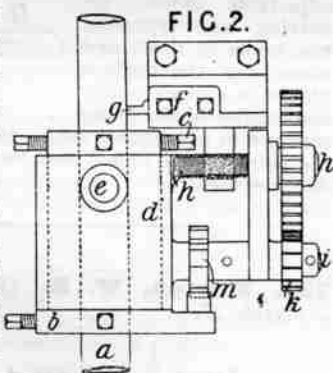
# HAND TOOLS AND BENCHES FOR THE USE OF METAL, WOOD, AND STONE WORKERS.

Patents have been granted in all cases, unless otherwise stated. Drawings accompany the Specification where the abridgment is illustrated and also where the words *Drawings to Specification* follow the date.

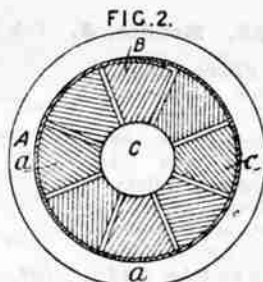
A.D. 1855.

## 16. Kendall, W., and Gent, G. Jan. 3.

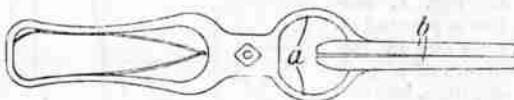
**Pipe and rod cutters.** The tube or rod *a* to be cut is suitably held, and on it is secured a bush *b* by set-screws *c* or by wedges. A casting *d*, rotated on the bush by handles *e* or other suitable means, is provided with a slide *f*, carrying a cutter *g*, and fed by a screw *h* actuated by gearing *i*, *k* and a star wheel *m*. The Provisional Specification describes a form in which the casting rotates on a pin formed on a block which can be held in a vice, the work being wedged into a hole in the upper end of the pin. This apparatus is stated to be particularly applicable for cutting tubing for gas burners &c.



like for making the bodies of packages, is first bent in an apparatus, such as that used in bending sheet metal, and is then formed into a tube, and the ends attached, by means of an apparatus such as that shown in Fig. 2. This consists of a metal cylinder *A*, within which is placed the scaleboard, bent as shown, so that the ends, treated with glue or other adhesive, overlap. The scaleboard is pressed to the cylinder by means of an inner cylinder *B* formed in segments *a*, which are pushed outwards by a conical block or wedge *C*.



## 146. Clarke, J. I., [Moat, F.]. Jan. 19.



**Pliers.**—In forceps for dyeing the edges of glove parts, the parts are held between jaws *b* of similar shape to, but slightly smaller than, the parts.

## 72. Robertson, A. Jan. 11.

**Clamps and cramps.**—Scaleboard or the

877-750-4/04 Wt 22104 L & M



**187. Samuel, B.** Jan. 25.

*Handles.*—The handles of knives, umbrellas, sticks, &c. are made of horn or hoof material encased in tortoiseshell to give the effect of solid tortoiseshell. The thin plates of tortoiseshell are made to adhere to the horn by heat and pressure in dies &c. Between these plates and the horn there may be interposed thin plates of shell hoof (shell from the hoof of the tortoise) fixed in the same way.

**211. Fontaine-Moreau, P. A., Comte de,** [a communication]. Jan. 27.

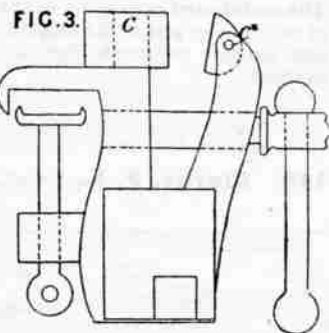
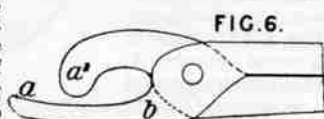
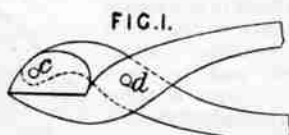
*Pincers* for use in the manufacture of metal eyes or thimbles have two segmental arms *a*, as shown.

**326. Kerr, R.** Feb. 12.

*Saws.*—Loaf sugar is divided into uniform lumps by saws or otherwise. By means of a series of straight saws, arranged parallel to each other at the requisite distance apart, the loaf may be cut first into slices or slabs, then crosswise into sticks, and then again crosswise into cubical lumps. A series of saws fixed in a hand frame may be used.

**425. Brodie, J.** Feb. 27.

*Pliers, cutters, and pincers; vices; forging-tongs.*—One or both jaws of tongs, pliers, vices, nippers, &c. are pivoted so as to be capable of accommodating themselves to the articles held, or they are provided with projections not opposite to each other, or additional jaws or holders are fixed to the levers behind the fulcrum. In Fig. 1, one jaw is pivoted at *c* to one of the levers of a pair of pliers, but two jaws, either or both being movable, may be fixed to the levers behind the fulcrum *d*, and, when the apparatus is used for holding ropes, wires, bars,



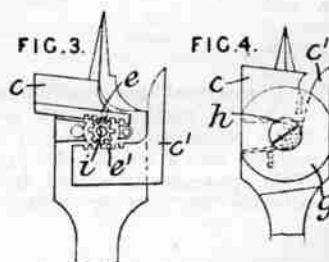
&c., the levers may be drawn together by means of a rope, passed through holes in the extremities of the same. In the vice shown in Fig. 3, the jaws are mounted on vertical and horizontal pivots *c, c'*. In the smith's tongs shown in Fig. 6, the projection *a\** on one jaw is not opposite to the projections *a, b* on the other jaw, and is hollowed to prevent the bar held, from moving laterally. The movable jaws may have corresponding projections. Pliers &c. having additional jaws behind the fulcrum may be used for holding rods, bars, and other parallel articles, as may also tongs consisting of two superposed T-shaped levers having side projections or jaws at the ends of the cross-arms.

**434. Reddie, J.** Feb. 28.

*Handles.*—An iron or metal shovel is provided with a wire *b* round the edge which may serve to aid in fastening the handle. The metal strap *c*, by which the bowl is connected to the handle by means of a tongue or a socket, is divided at its junction with the bowl and riveted to it as shown. Solder may be used as well as the rivets.

**502. Kennedy, J.** March 7.

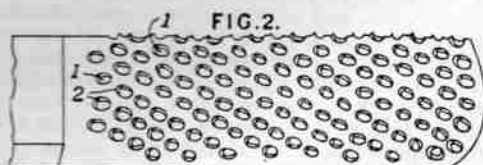
*Chisels; handles.*—An adjustable chisel, for cutting and trimming the heels of boots and shoes, has the blade *o* placed in a block *p*, the end of the blade being screwed to pass into a nut in the handle, so that the point of the chisel can be adjusted for any depth of heel.

**722. Newton, W. E.,** [a communication]. March 31.

*Wood-boring bits.*—In order that the cutters *C, C'*, Figs. 3 and 4, of an expanding wood-boring bit, may be moved simultaneously and through equal distances, they are provided with teeth which gear with a pinion *i*, Fig. 3, or with slots

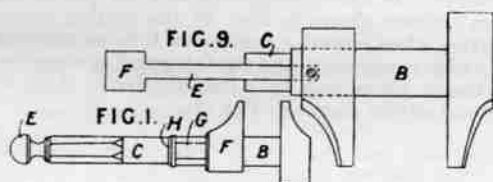
into which enter two pins, fixed to the cap *g*, Fig. 4. The cap is held down to fix the cutters by means of a screw or screws *h*. To prevent the cutters from falling out, pins may be passed through the bit-head into grooves in the cutters or the end teeth of the racks *e*, *e'*, Fig. 3, may be enlarged.

**742. Powers, H.** April 3.



*Files and rasps.*—A file or rasp for metals, wood, stone, ivory, bone, gypsum, &c., is provided with perforations 1 through which the filings pass, the cutting-edges 2 only partially surrounding the holes, and being on one or both sides of the file or rasp.

**830. Sculfort, G. I.** April 14.

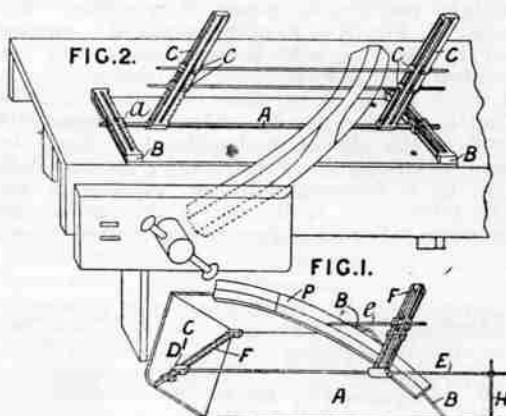


*Spanners and wrenches.*—In an adjustable wrench or spanner, two rods *G*, Fig. 1, flat on the inside and curved on the outside, are fixed to the movable jaw *F*, and slide on each side of the main rod *B* and through the collar *H*. They are threaded at their ends to engage with the internally-threaded handle *C* which rotates between the collar *H* and a knob *E*, screwed on to the end of the rod *B*. In another wrench, the side rods *E*, Fig. 9, terminate in a socket or nut *F*, which slides inside the handle, and engages with a screw, journaled in the end of the rod *B*, and in the end of the handle, and rotated by means of a knob.

**925. Victory, J. J.** April 25.

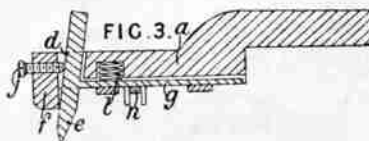
*Tools for setting-out work.*—Relates to apparatus for setting out curved lines upon wood and stone, particularly applicable for lining out wreathes for staircase hand-rails. The mould or pattern is lined out by the aid of a box, with two slides *A*, Fig. 1, and an end *C*, the edges *B* of the sides being cut to the pitch of the hand-rail. The marker *e* is carried by an arm *F* revolving on a rod *E*, mounted in a block *D*<sup>1</sup> and supported by an arm *H*. The block *D*<sup>1</sup> is adjustable along a screwed rod *F* and graduated scale to vary the

radius of the curve lined out on the mould *P*. A piece of wood is then cut to the outline of the mould and fixed at the required angle in a bench screw for the lining out to be completed by the apparatus shown in Fig. 2. Graduated slideways *B* are secured on the bench and provided with slides *a* carrying a rod *A*, on which are freely



mounted arms *C* carrying adjustable sockets *c* for two pairs of markers. The space between the markers of a pair corresponds to the desired thickness of the wood, and the slides *a* are adjusted to give the desired radius to the wreath. The work may be subsequently tested by long rods passed through the sockets.

**961. Newton, A. V.,** [a communication]. April 28.

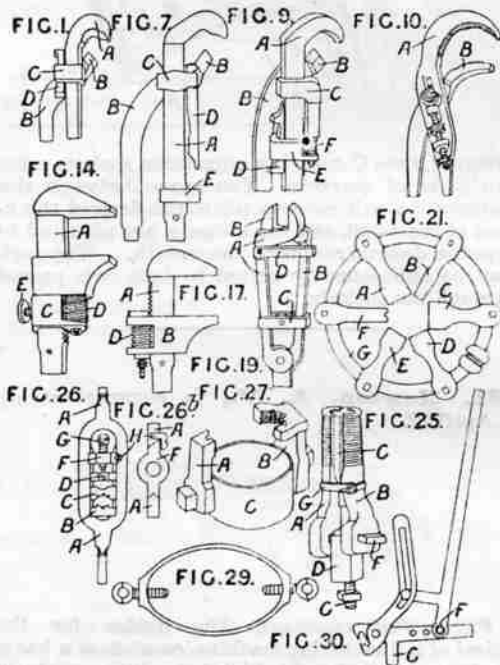


*File-cutting machines.*—The holder for the chisel of a file-cutting machine, consists of a barg *g*, having a pointed end, which takes into a hole in the back of the chisel *e*. The holder is situated in a groove in the underside of the arm *a*, and at right-angles to the oblique slot *d*, and is pressed downwards at the chisel end by means of a spiral spring *l*, and towards the chisel by means of a spring lever *n*. The arm *a* is provided with a lip *f*, and a set-screw *j*, by which the "set" of the chisel may be adjusted.

**1035. Williams, T., and Fuller, J. H.** May 8.

*Spanners and wrenches.*—Relates to pipe wrenches, coach spanners or wrenches &c. which are adjustable by means of screws, wedges, or springs, and to bed-keys. In the wrench shown

in Fig. 1, the collar C, on which the jaw B is pivoted, is fixed in any position on the handle of the jaw A by means of the wedge D. The pivot of the jaw B may be adjustable relatively to the collar C by means of a screw, in which case the collar C is fixed. The handle of the pivoted jaw B may be dispensed with and the jaw kept in an upright position by means of a spring. The collar C, Fig. 7, is fixed by means of a notched bar D which is held in engagement with the notched lever A by means of the sliding collar E. A screw F, Fig. 9, by which the collar C may be slightly adjusted, may be held in engagement with teeth on the edge of the handle of the jaw A by means of a wedge D. The opening of the jaws A, B, Fig. 10, is determined by the position of the adjustable pivot in the slot in the jaw A, but wrenches with similar jaws may have fixed pivots.



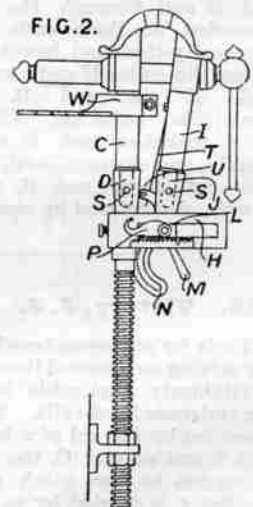
In a coach wrench a screw, attached to the movable jaw, passes through a hole in a fixed collar and is provided with an adjusting-nut, or an adjusting-screw D, Fig. 14, may be held in engagement with the toothed handle A by means of a screw E, or a wedge in the back of the collar C, the wedge being operated by means of a nut or a thumb lever. The end of the spindle on which the nut D, Fig. 17, works, may be wedge-shaped, so that when it is drawn down, the nut D is moved towards the teeth in the handle A. The jaw B may be connected to a band surrounding a nut which may be screwed up and down the handle A. The pivoted jaws A, B, Fig. 19, of an ordinary spanner are opened and closed when the collar C is moved up and down, and the jaws are prevented from coming together, when force is applied, by means of the notched spring D. The adjustment of the jaws may be

effected by means of a screw passing through them. In a bed-key, a number of bits A, B, C, D, E, F, Fig. 21, are placed on a ring G. In use, two opposite bits are turned up on opposite sides of the ring and fixed by means of wedges, one bit acting as a handle for the other. Two bits at right-angles, may be fixed to each end of a rod, the bits at one end being on the opposite sides of the rod to the bits at the other end.

*Combination tools; taps, stocks, and dies; pipe and rod cutters; pliers.*—Relates to adjustable taps, dies, &c., and to cutters for pipes, bolts &c. The two or more parts A, B, Fig. 25, of a tap are capable of being moved outwardly on the studs F by means of a wedge C, the screwed end of which passes through the square bolt D. In the wrench shown in Fig. 26 the screwing dies B, C, and the rod or pipe cutter D are closed up by means of a screw G, working in the piece, F, Figs. 26 and 26<sup>a</sup>, which is held in the stock A by means of the eccentric-headed screw H. The dies A, B, Fig. 27, of large stocks, or cutters for large pipes &c. are moved along studs projecting from the ring C by means of a band or ring such as is shown in Fig. 20, which has one or two adjusting-screws. The dies A, B, Fig. 27, and C, Fig. 26, may be made so as to screw different sizes of pipes &c., and the ring C, Fig. 27, may be in two parts, which are hinged together and provided with a fastener. In the cutting wrench, or pliers for wire or bolts, shown in Fig. 30, the cutting edges overlap when closed, a projection C to be gripped in a vice is provided, and the fulcrum F is movable. Ordinary pliers may have jaws similar to those of the rod cutter shown in Fig. 30.

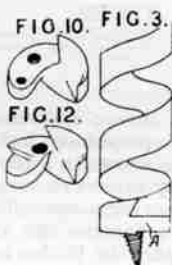
#### 1231. Henry, W. A. May 29.

*Vices.*—The two jaw-pieces C, I of a bench vice can rotate in sockets D, J. The socket D is threaded at its lower end, and the jaw C passes through a clamp W fixed to the bench. The socket J is pivoted to a block L, which is held in any position in the slide H by the pawl P, and moved in the slide by means of the lever M, attached to the slotted cam arm N, engaging with a fixed pin. The roller U which engages with the spring T is carried by the block L, so that the force exerted by the spring on the jaw I is independent of the distance apart of the jaws. The jaws may be fixed parallel to each other by pins S.



**1275. Newton, W. E.,** [a communication].  
June 4.

*Augers.*—Ships' augers are made with renewable cutting-bits A which are secured to the square end of the stock by a screw or screws, a steady pin fixed in the stock, and an undercut projection, as shown in Figs. 3 and 10. The bits may have leading screws, or the steady pin may be replaced by a second projection, as shown in Fig. 12.



**1327. Bakewell, F. C.,** [Hopper, W. S.].  
June 11. [Provisional protection only.]

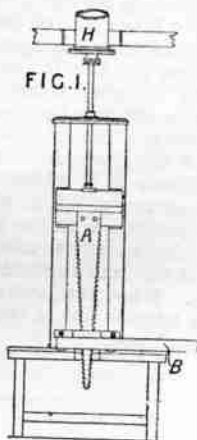
*Planes.*—A mouth-piece is let into the face of a plane to limit the throat opening, and to serve as a rest for the chisel, which is fixed in front of the wedge, and between it and a shoulder in the throat.

**1596. Newton, W. E.,** [a communication].  
July 16. [Letters Patent void for want of Final Specification.]

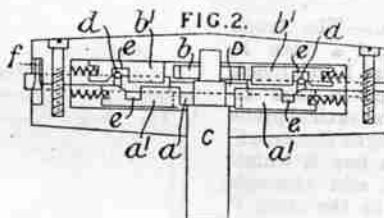
*Vices.*—The jaws of a vice are maintained parallel to each other by links, pivoted together at their centres, and carrying buttons or studs at their ends, which work in vertical grooves in the bodies of the jaws. The vice is mounted on a ball-and-socket joint.

**1635. Bousfield, G. T.,** [a communication].  
July 24.

*Chisels; combination tools.*  
—A mortising-chisel A is made from a tapered steel plate of a thickness depending on the width of the mortice to be cut, and is provided with teeth on its edges. A hole is drilled through the wood B into which the square end of the chisel is inserted, and then the chisel is driven through the wood. The chisel may be mounted on a vertical spindle and provided with an auger at its lower end, or it may be in two parts hinged together, so that the length of the mortice cut can be regulated.



**1922. Avery, J.,** [a communication]. Aug. 25.



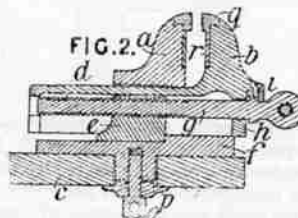
*Handles.*—A metal or other handle for an auger or gimlet &c., which may be rotated in either direction when the handle is oscillated, is hollow, and on the end of the socket c, Fig. 2, for receiving the tool, are fixed two ratchet-wheels a, b having their teeth in opposite directions. One of these wheels is engaged by either the upper or the lower pawls b', a', the other pair of pawls being withdrawn by means of the toes d which take into the notches e. The sides of the notches furthest away from the socket c are inclined, and the toes e which are carried by the longitudinal shaft D, can be raised or lowered by means of a spring lever f.

**1958. Stansbury, C. F.,** [Bleckmann, H. A.].  
Aug. 30. [Provisional protection only.]

*Planes.*—An adjustable steel plate, fixed by one or more set screws between two iron plates, is used instead of an ordinary double plane-iron.

**2110. Warren, W.** Sept. 18.

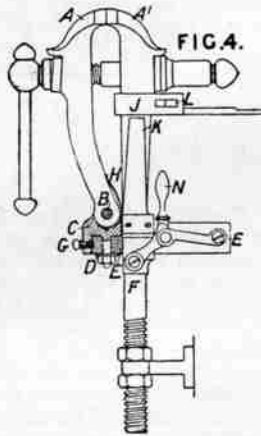
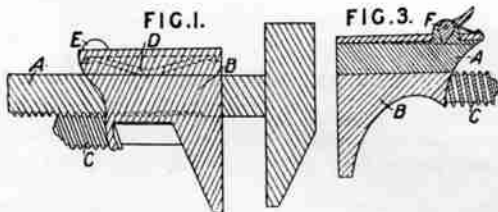
*Vices.*—In a parallel vice the fixed jaw a, Fig. 2, is in one with the bed-plate f, and the movable jaw b is in one with a bar d which slides through a hole in the jaw a and covers the screw g which works in the screw-box e dovetailed into the bed f. A collar h on the screw engages with the end of the jaw b and with a semicircular hollow collar i fixed to the jaw b. A boss to pass through the bench c, and a screw o and washer p are provided to allow the vice to swivel. The jaw faces q are grooved to fit the jaws as shown, and may be provided with extensions r dovetailed into the jaws, or the faces may be box-shaped so as to cover the ends of the upper parts of the jaws. The serrations are formed on the jaws by the tool of a planing-machine or the rotary cutters of a lathe.





**2130. Marchinton, J. M.** Sept. 24.

*Vices.*—The front jaw A of a vice is hinged at B to a block C, which is free to turn on a vertical pivot D in a lug on the stem F or in a bar E which can be slid through a hole in the stem F by means of the handle N, and fixed in any position by a pin screwed through the stem F and one of a series of holes in the bar. The vice is fixed to the bench by a key L and collar J embracing the polygonal portions K of the stem, and may be adjusted vertically by nuts engaging with its screwed lower end. The jaw A may be kept parallel to the jaw A' by a pin G, and is opened by a flat spring H, or by a helical spring placed between the top of the block C and a projection of the back of the stem of the jaw A.

**2162. Pitman, J. T.,** [a communication]. Sept. 28.

*Spanners and wrenches.*—In an adjustable wrench, in which a screw C, Figs. 1 and 3, or a series of projections on the movable jaw B is held in engagement with indentations on the bar A of the fixed jaw by means of a spring D, the hole in the jaw B is made larger than the bar A and the screw C &c. is put out of engagement with the bar, on the button E or lever F being depressed.

**2529. Bentley, W. H.** Nov. 10.

*Wood-boring bits.*—Fig. 27 (Sheet 2) shows an expanding centre-bit arranged to be screwed to a gun stock. The distance of the cutters 36 from each other is adjusted by the screw 35.

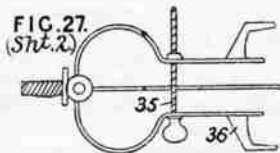
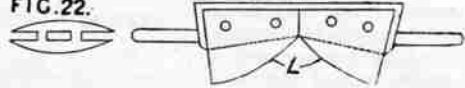
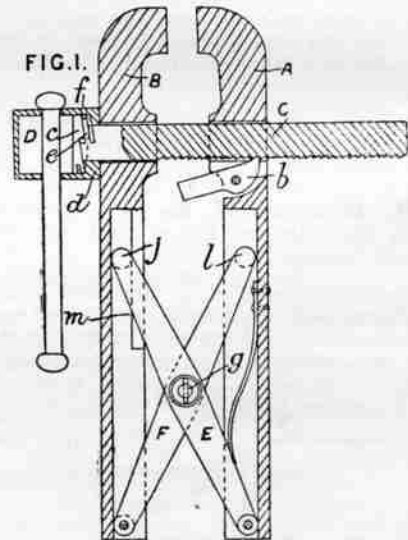
**2656. Jonquet, D.** Nov. 26.

FIG. 22.

FIG. 21.



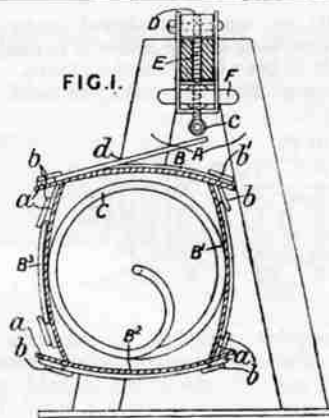
*Axes; spokeshaves and like tools.*—Fig. 21 shows a spokeshave having two steel blades L secured as shown in a recessed portion of a cast-iron frame by screws or rivets. Fig. 22 shows an axe head having a central hole for the handle and two slots to receive the axe blades. In another form of axe, the blades are arranged as in the spokeshave shown in Fig. 21.

**2805. Davis, R. W., and Davis, D.** Dec. 12.

*Vices.*—In the vice shown in Fig. 1, the ordinary screw is replaced by a pawl b, and a ratchet-bar C, the inner side of the head c of which is made with spiral faces engaging with corresponding shoulders d on the box D, the rotation of which is limited by the pin f working in the groove e, or a few threads may be formed on the end of the bar c and the box D replaced by a nut. To the bottom ends of the jaws A, B are pivoted the ends of the levers E, F which are pivoted together at their centres g, while their upper ends pass through openings m in the jaws, these openings being just wide enough to admit the levers E, F, but enlarged at the rear to receive the cylindrical projections j, l. When the jaws are of wood, a metal plate with a narrow slot in it, is fixed over a wider slot in each jaw.

2932. Grist, J. Dec. 27.

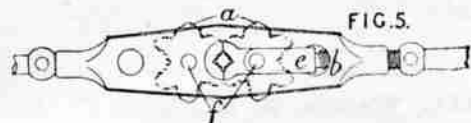
*Cramps and clamps.*—In bending cask staves *d*, the staves rest against stops *a* on the curved sides *B*, *B*<sup>1</sup>, *B*<sup>2</sup>, *B*<sup>3</sup> of a rotary heated vessel, the stops carrying slides *b*, *b*<sup>1</sup>, by which the staves are clamped or screwed.



A.D. 1856.

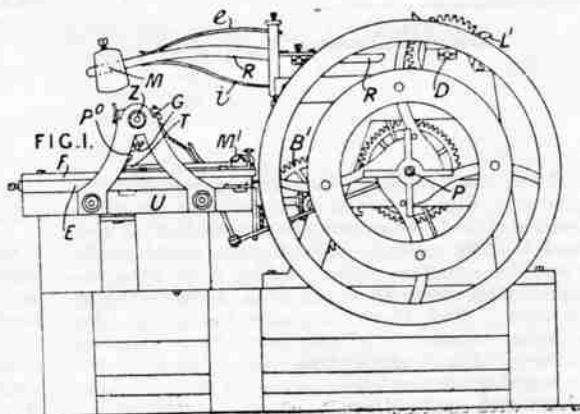
8. Shanks, A. Jan. 2.

*Stocks and dies.*—Screw-cutting dies *a* are made polygonal, so as to cut screws of several sizes as shown, one of the dies is pivoted at *f*, to the stock *b* and the other to shackle *e* sliding in the stock.

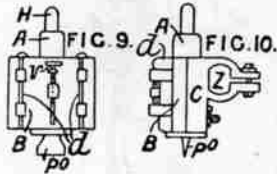


162. Lacroix, P. L. T. Jan. 22.

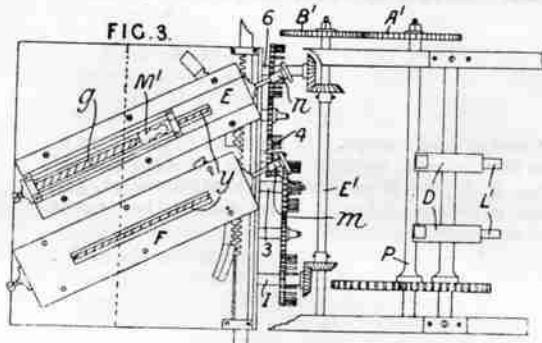
*File and rasp cutting machines.*—The blanks *g* are carried by slides *E*, guided in saddles *F*, angularly adjustable on a bed plate *U* by a rack and toothed segments. The cutting chisels or tools *P*<sup>o</sup> are spring-mounted in blocks *G* adjustably clamped on a shaft *Z*, which can be angularly adjusted to vary the inclination of the chisels. The chisels are struck by hammer heads *M* on stems *R*, actuated by cams *L*<sup>1</sup> on a shaft *D*, driven by gearing on the driving-shaft *P*. Springs *e*, *i* bear on opposite sides of the hammer stems. The blanks are fed forwards by screws *y* with wheels *m*, *n*, which engage pin wheels 4, 6 or 1, 3 according to the inclination of the slides *E*. The pin wheels are driven through change gearing *A*, *B*<sup>1</sup> and a shaft *E*<sup>1</sup> from the driving-shaft. The blanks are secured by



clamps  $M^1$  on semi-cylindrical rests  $T$ , capable of rocking on the slides  $E$  to enable the chisels to bear fairly on the blanks. In cutting round files, the rests are held in



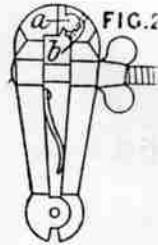
various angular positions to cut rows of adjoining cuts. In the chisel holder shown in Figs. 9 and 10, the chisel is held in a cylinder  $A$  and struck through a block  $H$ . The cylinder is adjustable vertically between blocks



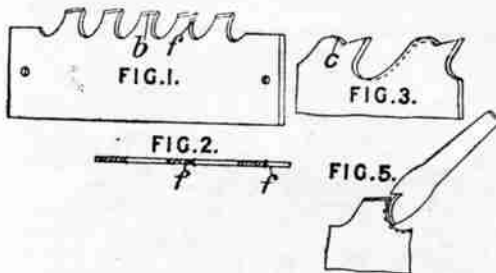
$B, C$  by a screw  $v$ . The blocks  $B, C$  are held together by cottars  $d$ .

**204. Dalgety, A.** Jan. 25.

*Vices; pliers.*—One or both jaws of a vice or pair of pliers &c., are provided with rolling and self-adjusting gripping-pieces  $a$ . The cylindrical socket may be either in the gripping-piece or in the jaw. The piece  $a$  is prevented from slipping out endways by a pin  $b$ .



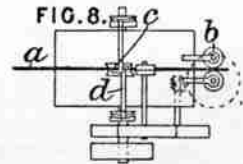
**411. Walenn, W. H.,** [Barlow, N.] Feb. 19. [Provisional protection only.]



*Saws; saws, setting.*—Saw teeth are made with grooves  $f$ , Figs. 1 and 2, in their front, or their front and back, edges, and are rounded off at the back  $b$ . The grooves may be made, or the teeth "set," by a tool as shown in Fig. 5, or by a reciprocating cutter when the sides of the teeth are straight. The teeth may also be set in the ordinary manner. A saw may have grooved cutters  $c$ , Fig. 3, alternating with ordinary teeth, or, openings through the saw may have their edges armed with such cutters.

**502. Exall, W.** Feb. 27.

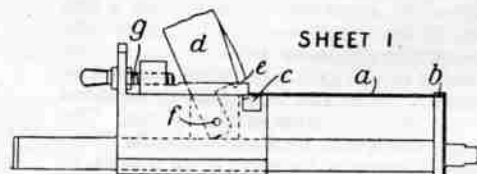
*Saws, setting.*—An apparatus for cutting and setting the teeth of band saws, is shown in Fig. 8. The saw  $a$  is fed forward between the dies  $c$  by the rollers  $b$ . The teeth are formed by the punches  $d$ , and are set by other punches working vertically below the saw.



**656. Cohen, B. S.** March 19. [Provisional protection only.]

*Handles.*—Handles are made from fuller's earth, which is ground with water, mixed with colouring or other material, moulded, and fired.

**715. Weston, M., and Carter, O.** March 26. [Provisional protection only.]

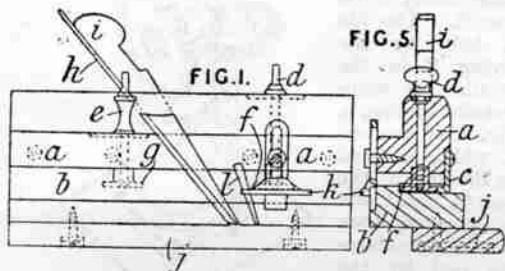


*Saws, setting.*—The saw  $a$  rests on a frame  $b$ , which can be extended to suit the length of the saw. The tooth is pressed against a hardened block  $c$  by a "cutter"  $e$  with a bevelled or toothed edge, formed on a hand-lever  $d$  pivoted at  $f$  to a block, the position of which can be adjusted by means of a screw  $g$  in order to adjust the depth of "set" of the saw.

**742. Meyer, J. C.** March 28. [Provisional protection only.]

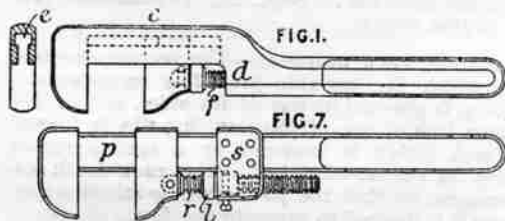
**Vices.**—A vice, for holding tapered and other irregular bodies, has its movable jaw mounted in a swivelling-piece, formed in the parallel bar of a "parallel" vice, or working in trunnions connected to the lower part of the fixed jaw of an ordinary vice, the box of the screw-nut being hinged to the jaw in the former case, and the head of the screw being partly spherical and fitting into a corresponding recess in the movable jaw, in the latter case. Adjustable pieces, fitting into concave recesses in the jaws, may also be used.

**819. Bousfield, G. T.,** [a communication]. April 4.



**Planes.**—The body of a moulding plane is arranged to receive a number of detachable faces having different mouldings thereon. The faces *b*, Figs. 1 and 5, are grooved to engage with an angular bracket *c* fixed to the body *a*, and are provided with transverse undercut grooves to receive the nuts *f*, *g* into which the fixing screws *d*, *e* are screwed. A width-gauge *j* may be fixed to the face *b*, and a depth-gauge *k* to the body *a*, and the iron *h* may be fixed by a claw and thumb-screw instead of by a wedge *i*. The cutter *l* is for clearing-out corners.

**1298. Wilson, T.** June 2.

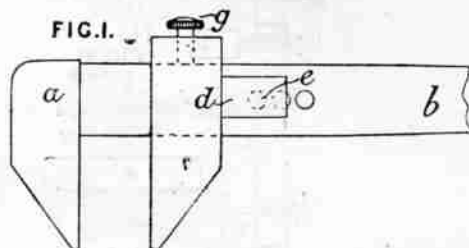


**Spanners and wrenches.**—The adjusting screw of a wrench is placed directly under the movable jaw, which either engages in an undercut groove *e*, Fig. 1, in the body *c*, or surrounds the body *p*, Fig. 7. The handle *d* may be bent into line with, and receive the end of, the screw *f*, or the nut may be secured to, or made in one with, the handle, or the nut *l* may rotate in a bracket *s* and the screw *r* be fixed.

**1513. Shanks, A.** June 27. Drawings to Specification.

**Vices.**—The two jaws of a vice for a drilling or boring machine are actuated by a right and left handed screw, thus causing the work to be centered.

**1585. Millward, R.** July 7.



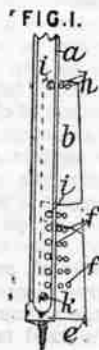
**Spanners.**—The distance between the fixed and movable jaws *a*, *c* of a screw-key is adjusted by turning the polygonal block *d* on its pivot *e*, so as to bring one or other of its faces, which are at different distances from the pivot, into contact with the jaw *c*. A series of holes for receiving the pivot *e*, and a thumb-screw *g* are provided.

**1691. Mehrel, E.** July 18. [Provisional protection only.]

**Planes.**—The iron of a jointing, trying, rabbeting horse, or other plane for wood, &c., is fixed in any position by a thumb-screw, which passes through the longitudinal slot in the iron, and engages with a nut, in a groove in the plane body, or fixed across the mouth of the plane. The slot may be opened at the upper end, and when a double iron is used, the two parts are held together by a thumb-screw, and a second nut in the groove in the plane body. The mouth or opening may be at one side, and a movable rule may be fixed to the face of the plane to serve as a guide-piece, and adapt the plane for use as a rabbeting-plane.

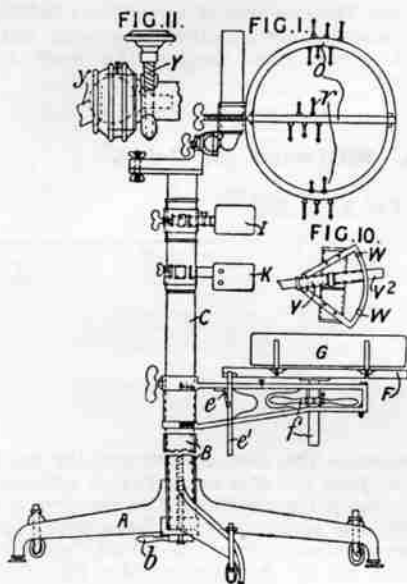
**1812. Brooman, R. A.,** [a communication]. July 31.

**Augers.**—An auger or boring-tool is provided with an additional, and adjustable, plate or cutter *b*, Fig. 1, the lower end of which is provided with a spur *e*, and a bent cutting-lip. The plate takes into a longitudinal slot in the auger shaft *a*, and is fixed by two tapered pins *i*, the size of the hole cut depending on which holes *f*, *h* the pins are passed through. The plate may have a strengthening-rib on its outer edge, and may be additionally secured in the shaft *a* by a set-screw *k*.





2053. Hart, J. T. Sept. 4.



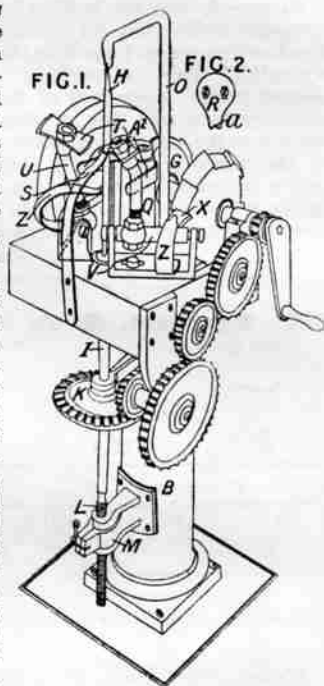
*Tools for setting-out work.*—Relates to adjustable apparatus for use in modelling in clay or stone from life, and for measuring and copying statuary &c. Fig. 1 shows a stand fitted with a seat F, for supporting a living model, or the marble, clay, or material to be operated on, adjustable body rests or pieces K, L, and jointed elliptical frames O for supporting, gauging, or taking measurements of the head. A vertical shaft C, to which the devices are clamped, is adjustable within a hollow pillar B of a tripod stand A by a handle b and screw. The seat is adjustable by a screw f and a rod e<sup>1</sup>, which is clamped in a circular slot in the seat and is held to the seat by clamping-screws. To allow the pieces to be moved into contact with the model, the clamps, arms, and rods are formed with sliding, pivoted, and ball-and-socket joints, fitted with clamping-screws, and the head frames O are constructed of curved jointed members fitted with adjustable pivoted sliding radial needles, or blunt padded bearing rods or supports r. Fig. 10 shows a rod V<sup>2</sup> clamped in a sleeve V, which is pivoted at the centre of a quadrant and moves into, and out of, action to an extent limited by stops W. A spring clip of the quadrant holds the arm in any position between the stops. Fig. 11 shows a method of clamping a ball-jointed rod y by means of a conical screw Y, which bears against the ball, or against a cup in contact with the ball. For arranging and measuring drapery, a plate or support is attached to a U-shaped rod secured to a stand on castors similar to A. In modelling clay, the needles are pressed into the plastic material, and in cutting marble statuary they serve as gauges. The shaft C may be fixed to an angular frame with legs adapted to enter sockets of a fixed table. Ribs of the table engage with grooves in the frame.

2080. Newton, A. V., [a communication]. Sept. 6.

*File-cutting machines.*—In the machine shown in

Fig. 1 for spirally-cutting round files, the lower end of the file H is fixed in the shaft I which is rotated and raised by the bevel gearing K, screw L, and divided nut M, and the upper end is steadied by the bent rod O which slides freely in the post B. The file is held by the spring S in the angular or semi-circular bearing a, Fig. 2, of the bed R which is fixed on the top of the post Q, Fig. 1, and is operated upon immediately above the bed by the circular or partly circular cutters T.

The cutters are projected against the file by the springs Z, when the arms X on the spindles V are freed by the wiper-wheels G. The cutters are thrown back from the file by the springs A<sup>2</sup>, which are bent more, and thus diminish the force of the blows, as the size of the file at the point operated on decreases. The cutters may be turned partly round, on their levers U when one part of their cutting edges has become dull.



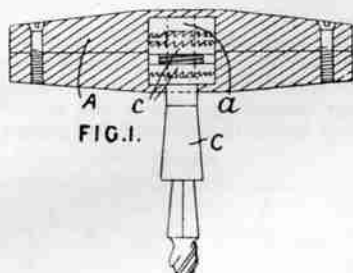
2222. Wilson, J., and Wootton, G., [a communication]. Sept. 22. [Provisional protection only.]

*Spanners and wrenches.*—The rectangular bar, on which the movable jaw of a screw-wrench slides, is grooved on one of its sides, and on the inner face of one of the resulting ribs is formed a rack which is engaged by a spring-pressed pawl on the movable jaw. The rack teeth are arranged so that the pawl must be raised, whenever it is desired to separate the jaws.

2230. Newton, A. V., [a communication]. Sept. 23.

*Handles for augers, gimlets, boring bits, screw-drivers, corkscrews, and other rotary tools.* As adapted for a gimlet, or corkscrew, crown

ratchet-wheels *a* are fixed in recesses in the handle *A*, and are adapted to engage alternately with ratchet-wheels *c* on the squared end of the

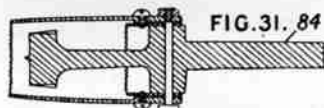


shank *C* as the handle is turned backwards and forwards. The ratchet arrangement may be modified.

**2567. Young, J.** Nov. 1. [*Letters Patent void for want of Final Specification.*]

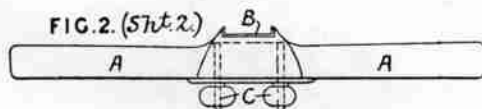
*Cramps.*—The movable jaw of a flooring cramp is operated by a screw, a nut toothed round its circumference, a worm or tangent screw engaging therewith, and a winch handle.

**2594. Urion, L.** Nov. 5.



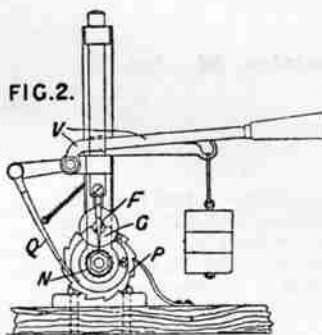
*Augers, hollow.*—An auger bit or sieve saw 84 is used for making round match-boxes, and a similar tool with a shorter bit for forming the covers.

**2657. Bernard, J.** Nov. 11.



*Spokeshave-like tools.*—A tool for paring the soles and heels of boots and shoes, has the cutting-blade *B* mounted similarly to an ordinary spokeshave in the handle *A*, and capable of adjustment by the screws *C*. At each end of the blade, a raised guard or fence is provided for protecting the upper.

**2717. Blanchon, E.,** [a communication]. Nov. 17.



*Tools for setting-out work.*—Relates to apparatus for making marks in leather and other material to indicate where holes are to be bored. Fig. 2 shows a front view of the marking-apparatus. The material is marked by a vertically-reciprocating bit or awl *F* while it is being intermittently fed forward between a plain disc *G* and a serrated disc *N*, the feed being caused by a ratchet *P* and pawl *Q* operated by a lever *V*, which also causes the reciprocation of the tool *F*.

**2958. Newington, S.** Dec. 12. [*Provisional protection only.*]

*Handles.*—In hoes which may be used for paring turf, or converted into cultivators, the ends of a reversible steel cutter are turned up at right-angles and adjustably clamped in holes in a cross-bar at the end of a bent handle. The cross-bar carries two coulter to turn over the cut weeds, and one or more weights.

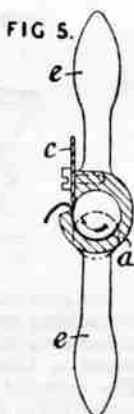
**2974. Newton, A. V.,** [a communication]. Dec. 15. *Drawings to Specification.*

*Vices.*—A vice for holding pipe fittings while being machined, is provided with two pairs of jaws, operated by vertical right and left hand screws, so that one pair may hold a fitting during machining, while another fitting is secured in the other pair. The jaws are carried by a top which can be rotated on the base of the vice and locked by pivoted handles engaging a notch in a pan on the base. The jaws have interchangeable faces to suit the fittings.

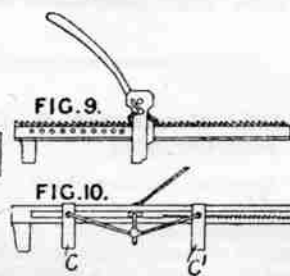
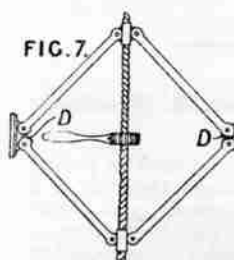
## A.D. 1857.

## 54. Trattles, M. Jan. 6.

*Augers, hollow.*—A tool for shaping broom handles, treenails for ships and similar cylindrical or tapered articles, is provided with a bell-mouthed hollow spindle *a* which is slit diagonally to allow of the insertion of a cutter *c*. The tool is rotated by the handles *e*.



## 62. Hill, H. C. Jan. 7.

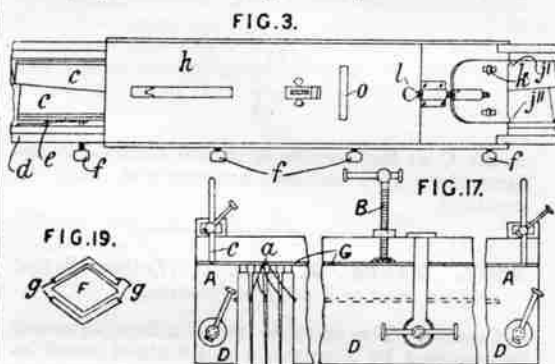


*Cramps.*—Consists of improved toggle and lazy-tongs levers applicable *inter alia* to flooring cramps. In Fig. 7 the plates are pressed apart by two toggles operated by a right and left hand screw, the two toggles being geared together at D. In a modification, the levers are crossed and additional pairs added, thus forming a lazy-tongs arrangement. In another modification, Fig. 10, one plate C is operated by a toggle having as abutment a plate C' adjustable by means of a rack. In a third modification, Fig. 9, the movable plate is operated by a pawl-lever and rack.

## 151. Fortune, N. Jan. 19.

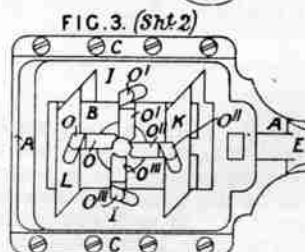
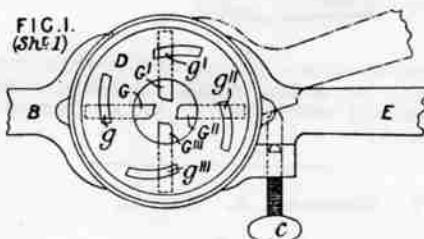
*Planes; clamps.*—Relates to the shaping of wood &c. knife handles. A number of roughly-shaped knife handles *c*, *c* are clamped in a trough by screws *f* bearing on springs *e*. A hand plane *h* is suitably guided on the recessed edges of the trough. The plane contains a knife *k* with shaped edges *j*, *j* for trimming the handles. The knife is adjusted by a screw *l*. A second knife of usual form fits in the hole *o* and serves to plane the flat surfaces. Fig. 17 shows a clamp for holding a number of handles while their butt ends are

shaped by a moulding plane or blade. The handles *F* are clamped on a board *A* by a top board (not shown) forced down by screws *D*. The handles are spaced by pins *a* and are arranged evenly by a board *G* adjusted by screws *B* and



bars *C* clamped by screws *D*. Fig. 19 shows a form of clamp for holding the handle *F* while the edges are removed by a plane. The clamp consists of a metal tube in two parts *g*, *g* of the section shown.

## 239. Doelling, G. L. Jan. 27.

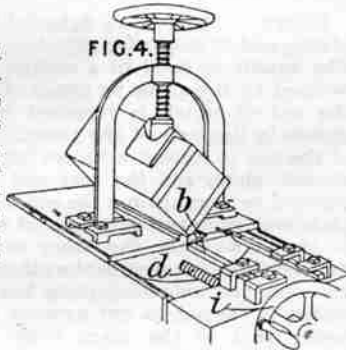


*Stocks and dies.*—Two kinds of screwing-stocks with adjustable dies are shown in the Figures. The dies *G*, *G*, *G*, *G*, Fig. 1, slide in radial grooves in a plate secured to the handle *B* and have projections *g*, *g*, *g*, *g* which enter cam grooves in a plate *D* secured to the handle *E*, the relative positions of the plates and consequently of the cutters being adjusted by a screw *c*. The dies *O*, *O*, *O*, *O*, Fig. 3, slide in radial grooves in the central projection *B* of the stock *A*, and

have projections  $o, o', o^{11}, o^{111}$ , which enter inclined grooves in a plate I, or in transversely-moving plates K, L engaging with inclines in the plate I, which is moved in the stock A by a lever (not shown) capable of being locked in any position relatively to the handle E by a toothed quadrant and a thumb catch. A covering plate (not shown) is secured beneath the plates C.

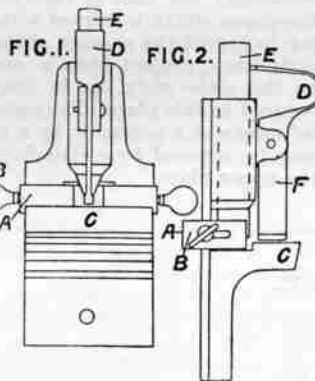
**272. Montagu, S.** Jan. 30.

*Cramps and clamps.*—Packing-cases are clamped, as shown in Fig. 4, to facilitate the cutting of slits by cutters  $b$ , to receive sheet metal corner pieces.



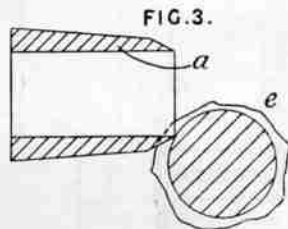
**734. Marshall, G.** March 16.

*Saws, setting.*—In an apparatus for setting saws, the adjustable fence A, Figs. 1 and 2, is fixed by two or more screws B, and a spring D is provided which causes the saw to be gripped between the rest C and the lever F when the punch E is depressed to set a tooth, and also serves to lift the punch E.



**841. Wilson, J. W.** March 25.

*Gouges; chisels.*—A gouge chisel  $a$ , with a circular cutting-edge, is formed from a steel tube, the hole through the tube being open at both ends.

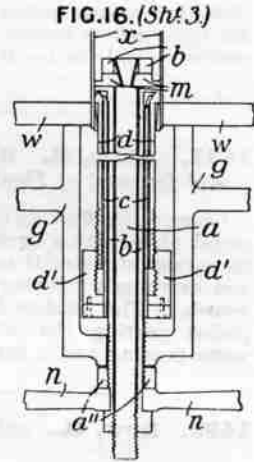


**931. Craddock, T.** April 3.

*Pipe cutters.*—Fig. 16 (Sheet 3) shows an apparatus for cutting-off the ends of boiler tubes, and withdrawing them and their ferrules. The split sleeve  $d$  is expanded in the tube  $x$  by a conical sleeve  $c$ , worked by a nut  $d^1$ ; then, cutters  $m$  carried

on a sleeve  $b$  are rotated by handles  $n$ , and fed outwards by a wedge on the bar  $a$ . The part  $b$  is withdrawn by the nut  $a^{11}$ , which bears on the support  $g$ .

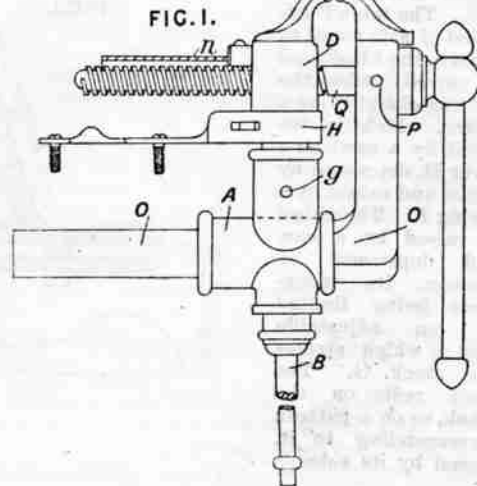
*Pipe trimmers.*—A machine for simultaneously boring and turning the ends of boiler tubes comprises a bar with an annular recess into which the tube passes, and into which radial cutters project. The cutter bar is fed forward as it is rotated by a fine thread, engaging a nut on its guide, to which the tube is fixed. The apparatus may be driven by power, and two of them may be mounted on one frame to work on both ends of a tube simultaneously.



**1253. Moseley, T. B.** May 4. [Provisional protection only.]

*Holding and picking-up tools, hand.*—Relates to a pneumatic holder suitable for photographic and other purposes. To a wooden handle is fixed an annular piece of wood &c., in which is placed a bell-shaped piece of india-rubber connected by a wire to one end of a horizontal lever, the fulcrum of which is a pin passing through the handle. On forcing down the lever, the india-rubber is raised in the wooden ring, producing a partial vacuum, and causing the india-rubber to adhere to any article against which it is placed. The lever may be held by a sliding link or other means.

**1361. Hyde, W., and Hyde, J.** May 14.





*Vices.*—The movable jaw P of a parallel vice is formed with a horizontal part or bar O, which slides in a boss or socket A. A pin on the jaw D fits into, and is locked by, a cross-pin g in the socket A, and the leg B is screwed into or other-

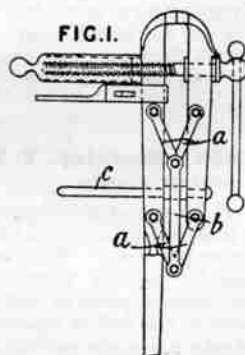
wise fixed in the socket. A shield n for the screw Q is secured to the jaw D, which is surrounded at its lower part by a clip H, terminating in a broad plate which is screwed to the bench.

**1421. Aldis, E.** May 20. [Letters Patent void for want of Final Specification.]

*Cramps.*—A flooring or like cramp consists of a metal plate, with a fixed and movable projection by means of which it may be secured to a joist, and carrying a "pusher" for acting on the floor boards. The pusher is operated by rack and pinion gearing, the pinion being actuated by worm-gearing and a handle.

**1493. Low, R., and Press, W.** May 27.

*Vices.*—The movable jaw is retained parallel to the fixed jaw by a parallel motion a, b and one or more guide-rods c connected to the movable jaw and sliding in the fixed jaw. The invention may be applied to existing leg vices.

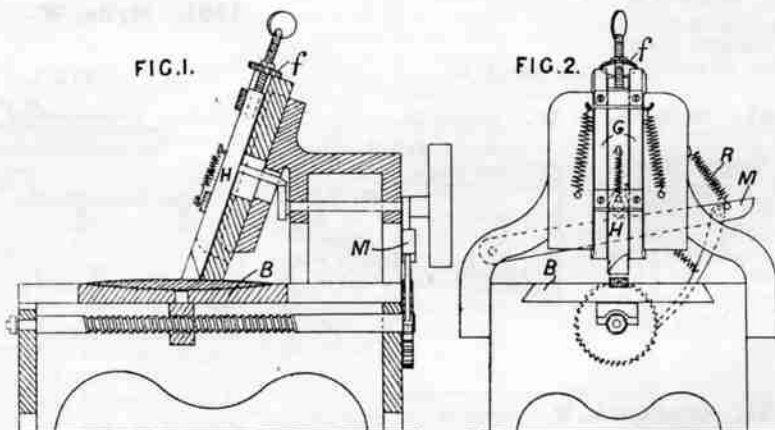


**1733. Caldicott, T. F.,** [a communication]. June 20. [Provisional protection only.]

*Planes.*—Relates to detachable handles for planes, and to means for adjusting the cutters &c. The handle is fixed to a slotted plate, which is secured to the plane by means of a thumb-screw, the nut of which is received by an undercut groove in the body of the plane. The upper part of the nut is formed with two lugs to receive the slotted plate, and the rear end of the plate is cranked to abut against the end of the body. The plate may be in two parts, one of which is secured to the plane, while the other is slotted, and can be adjustably secured to the other part. A metal grooving and tonguing plane has a single cutter, which is shaped to cut grooves or tongues, the under part of the plane body being suitably formed for the same purpose. The cutter is secured in the plane by means of a bolt, passing through the gauge-cutter, and a slotted plate secured at the back of the throat and opening in the plane, which is formed with an opening at the top to permit the passage of the nut. The slotted plate may project from a metal plate secured on the plane body, and in this case the handle is secured to this plate. The cutter can be adjusted by means of a screw, or by a rack and pinion, or may be secured by a clamping-holder carried by the upper plate.

**1740. Newton, W. E.,** [a communication]. June 22.

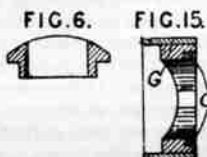
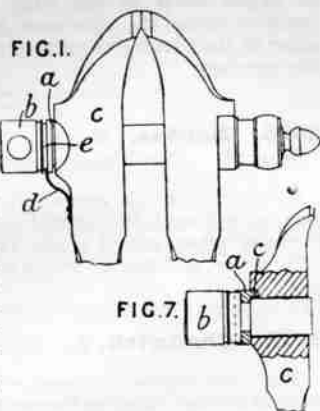
*File-cutting machines.*—Relates to means for cutting a file to a constant depth from end to end. The table B has a bed of soft metal to receive the blank, and is moved under the cutting-chisel H by a screw, which is rotated by a pawl on a lever M, depressed by a cam and raised by a spring R. The chisel is raised by a cam and depressed by springs, its movement being limited by an adjustable stop f, which strikes the stock G. The stock rests on the blank, or on a pattern corresponding to it, placed by its side.



1888. **Brooman, R. A.**, [Neullies, —].  
July 7.

*Vices.*—In a vice washers are placed between the ends of the screw and screw-box and the jaws.

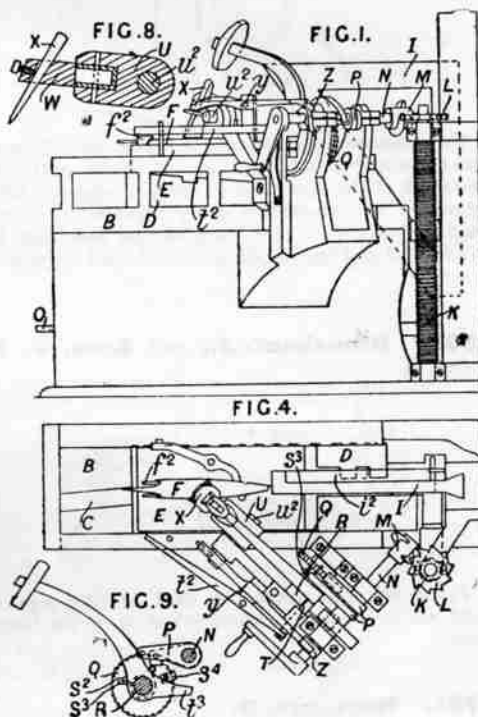
In the vice shown in Fig. 1 the head *b* of the screw is recessed to receive a washer *a*, shown in section in Fig. 6. The face of the washer is spherical, and is received by a spherical recess in the jaw *C*. The head *b* of the screw is pressed towards the washer by a spring *d* entering a groove *e*. The other jaw may be fitted with a similar washer. A flat washer *a*, Fig. 7, may be interposed between the head *b* of the screw and the jaw *C* of an ordinary vice. A recess is formed in the jaw *C* to receive a projection *c* on the washer *a*. Another form of washer is shown in section in Fig. 15. To prevent the washer from revolving projecting pins cast on or screwed into the jaw of the vice enter recesses *c* in the washer. In order to prevent the screw box from revolving a key formed on it is received by a keyway cut in the back washer. Each washer is surrounded by a dirt-excluding hoop *G*, which is formed in one with it or is shrunk into place.



2161. **Newton, W. E.**, [a communication].  
Aug. 13.

*File-cutting machines.*—In a machine for cutting files, the chisel holder *W* fits loosely in the stock *U* so that the chisel *X* can find its own adjustment upon the blank *F* which is secured to the table *E* by a jointed tang-holder *f*<sup>2</sup>. The chisel is pressed against the blank by a pin on the socket shaft *n*<sup>2</sup>, a lever *y*, and a cam *Z* on the main shaft *N* immediately before each stroke of the hammer. The hammer is mounted on an arm projecting from the axis *R* and is lifted by means of the arm *t*<sup>3</sup> and a cam on the shaft *N*, and depressed by a spiral spring fixed at one end to the axis *R* and at the other end to a ratchet-wheel *Q* loose on the axis. The spring is gradually wound up by pawls *P* on the shaft *N*, so as to increase the strength of the blows, while the blank is being cut for a short distance from the point towards the tang, and the pawls are then thrown out of action by the adjustable plate *s*<sup>4</sup> on the wheel *Q*. The pawls *P* are lifted by the bar *T* and the lever *t*<sup>2</sup>, and the wheel *Q* is allowed to run back at the commencement of each cutting-operation until

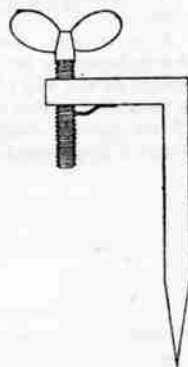
its pin *s*<sup>2</sup> contacts with a pin *s*<sup>3</sup> on the axis *R*, so that the initial strain of the spring is constant. In order that the chisel may upset the teeth of the file at each blow of the hammer, the table *E* is free to move obliquely on the table proper *D* which is advanced along the bed *B* in the direction of the slot *C* by means of a tongue *i*<sup>2</sup> on the triangular



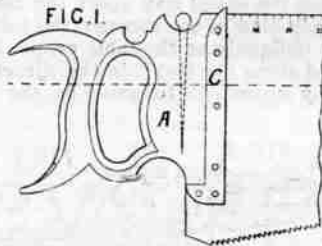
gate *I*, a nut carried by the gate, or screw *K*, wheel *L*, and an intermittent worm *M* on the main shaft. The nut is thrown into and out of engagement with the screw *K* by a foot lever *O*. The blank is cut in the oppositely-inclined direction in another machine.

2337. **Imbert, L. A.** Sept. 7. [Provisional protection only.]

*Cramps; tools for setting-out work.*—An iron cramp, with a point for driving into the wall, is used to hold a straight-edge employed for making plaster mouldings or for straightening walls and edges.

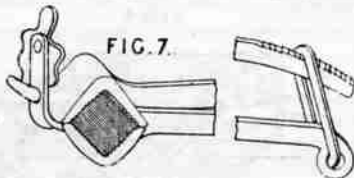


2509. **Johnson, J. H.**, [Gorham, J.].  
Sept. 30.



*Combination tools; handles.*—The shoulders of the handle of a hand-saw are at right-angles to the back of the saw, and so form a square. The edges of the shoulders are protected by metal angle pieces C. The back of the saw may be graduated and the handle may be bored to receive a scriber.

2562. **Stoneham, J.**, and **Lees, J. P.**  
Oct. 6.



*Pliers or pipe tongs.* A lead or like pipe is held, while a union nut is screwed on by the tongs shown.

2791. **Harcourt, D.** Nov. 3. [Provisional protection only.]

*Wrenches.*—One limb of an adjustable wrench is screwed to receive a nut, by which the position of a sliding-sleeve is determined. The movable jaw is pivoted to the sleeve. In one modification, the movable limb is a lever, having a grooved or notched wheel to serve as the jaw. In another the movable limb consists of a lever acting on a valve-joint in the holding-jaw.

2795. **Newton, W. E.**, [a communication].  
Nov. 3. [Provisional protection only.]

*File-cutting machines.*—The depth of cut throughout the length of a file is controlled by a wedge at the top of the toggle by which the cutter is actuated. The wedge is connected to a shoe which moves over the face of the blank. The blank is supported on a rolling-bed fitted to the

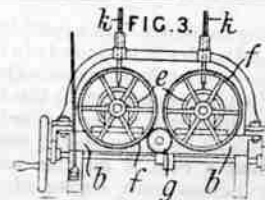
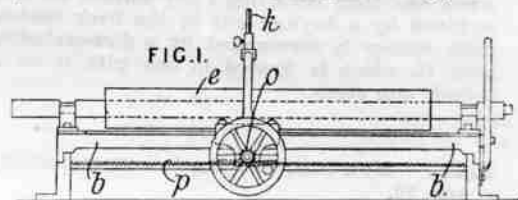
carriage, "with rollers interposed" to ensure a uniform cut across the file, by causing the blank to adjust itself to the edge of the cutter. A tumbler causes the shoe and cutter to be lifted clear of the blank during the return movement of the carriage.

2935. **Bordas, E. O.**, [a communication].  
Nov. 24. [Provisional protection only.]

*Screwdrivers.*—A screwdriver for use in removing and applying special tips to billiard cues, is made "sharp edged at one end and pointed at the other, and fixable into a wooden handle."

3079. **Chadwick, J.** Dec. 15.

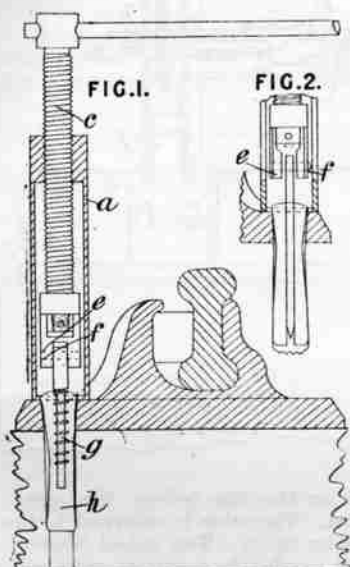
*Tools for setting-out work.*—Relates to an improved method of using the metal types in surface roller printing, and a machine for measuring, setting and adjusting the said types on the rollers. The types are fixed to rollers of iron or other suitable metal, which are drilled at intervals to receive screws passing through the blank parts of the types. Other means of fixing may be adopted, but are not so advantageous. A tool for accurately setting out two cylinders to receive types, or for adjusting the types so that they register correctly is shown in Figs. 1 and 3. The cylinders are connected by gearing *f, g*, so that they move exactly in phase with each other. A carriage, carrying two pointers *k*, can be slid along the framing *b*, by a pinion *o* gearing with the fixed rack *p* thereby causing the two pointers to describe straight lines accurately parallel to the axes of the cylinders. By a combination of the two motions the types or



blocks may be accurately set and adjusted in similar positions on the two cylinders. The method is applicable to cylinders used for printing fabrics, yarns, paper, and other materials.

A.D. 1858.

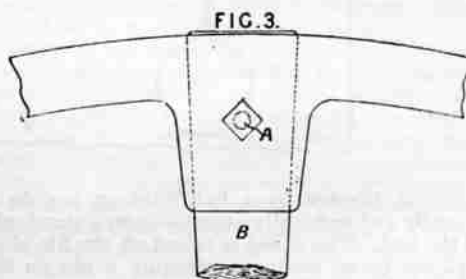
## 71. Badge, R. J. Jan. 16.



*Spike-extractors.*—Relates to an arrangement for extracting spikes and trenails. A screw *g* is driven into the trenail *h* to be extracted, and is then connected by a pin *f* with a screw *c* working in a frame *a*; the trenail is thus with-

drawn when the screw *c* is turned. Fig. 2 shows how the apparatus is applied to extract the trenail described in Specification No. 2656, A.D. 1857, [*Abridgment Class Nails &c.*]. The screw *c* is connected to the central spike which is formed with a head similar to that of the screw *g* in Fig. 1, and the central spike withdrawn, thus loosening the trenail. Any kind of connection may replace the pin joint *f*, and any form of frame may be employed.

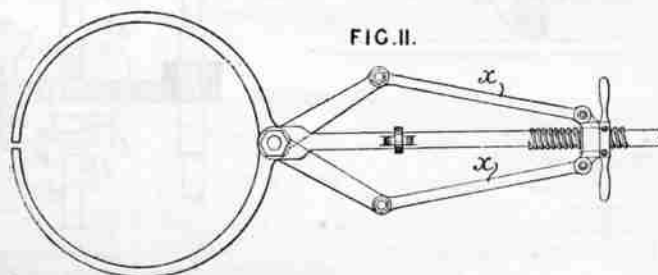
## 169. Kaye, W., and Kaye, C. Jan. 30.



*Handles.*—The eye of a mattock, pick, hammer, hoe, &c. is made tapered and of a greater length than usual, and the handle is secured in the eye by a set-screw *A* or a pin.

## 441. Vasserot, C. F., [Dory, F., and Badin, J.], March 5.

*Pliers.*—Fig. 11 shows a pair of tongs for handling an iron wheel during heating and welding. The jaws are opened and closed by arms *x* operated by a screw.

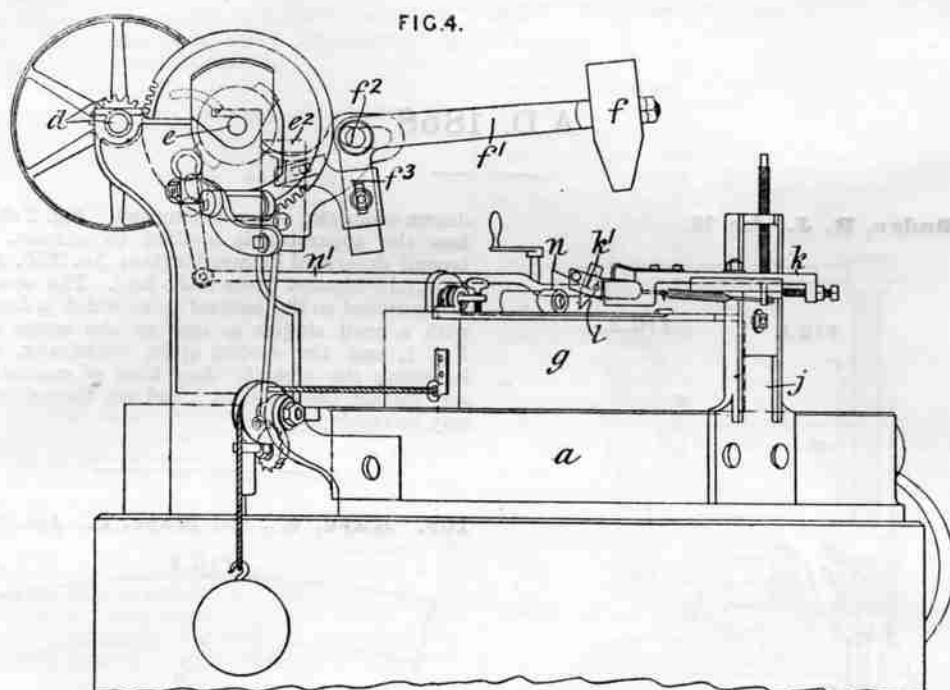


## 815. Preston, F., and McGregor, W. April 15.

*File-cutting machines.*—The blank is carried by a table *g* intermittently fed along a bed *a* by ratchet gearing and a screw, actuated by cams on a shaft *e* geared to the driving-shaft *d*. The

table has a recess, open at one side, to receive the file. The hammer *f* is carried by a lever *f*<sup>1</sup>, having an adjustable pivot *f*<sup>2</sup>, and an adjustable tail-piece *f*<sup>3</sup> on which cams *e*<sup>2</sup> act to raise the hammer. The adjustments permit the force of the blow to be varied and the size of the head to be changed. The chisel *l* is secured in a

FIG. 4.



holder  $k^1$ , pivoted by a ball joint on a slide  $k$ , laterally and vertically adjustable on a standard  $j$  on the bed. The chisel is raised off the file after each cut by an incline  $n$  engaging a pin on the chisel holder, and pushed forward by a cam and rod  $n^1$ . The incline is drawn back by a spring to allow the chisel to be returned by a spring

to rest on the file before the next blow is delivered. The table is returned to the starting position by hand. The chisel holder shown in Fig. 8 is carried by a spring arm  $g$  and provided with a "compensating guard"  $r$ , which is always held in contact with the face of the file, by means of a spring on a sliding plate acting against projections

FIG. 8.

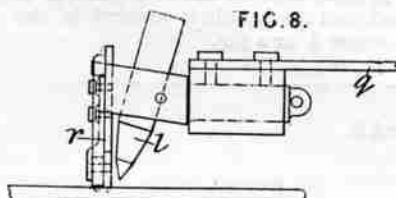
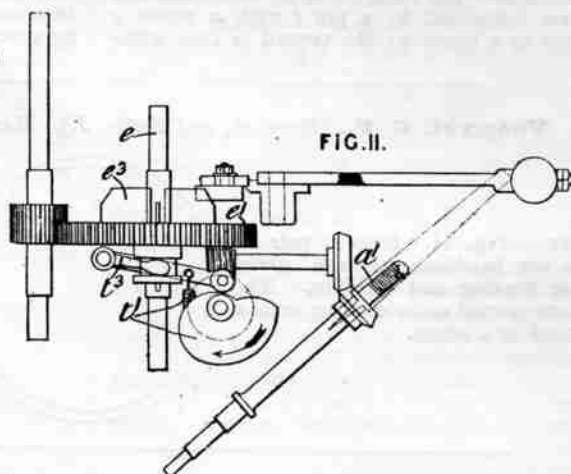


FIG. 11.



on the holder. Fig. 11 shows an arrangement for automatically varying the force of the blow in cutting taper files. When cutting the taper end of the file, the hammer has a smaller lift than when cutting the parallel wide part. The lift is varied by sliding the wheel  $e^1$  along its shaft  $e$ , the actuating cams  $e^2$  on the wheel vary-

ing in radius. The wheel is slid by a lever  $t^3$  actuated by a cam  $t^1$  driven by worm and bevel gearing from the feed shaft  $a^1$ . The Provisional Specification states that the chisel may be mounted in the holder so as to swivel to adapt itself to the face of the file.

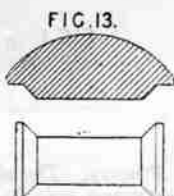


**817. Cowell, L.** April 15.

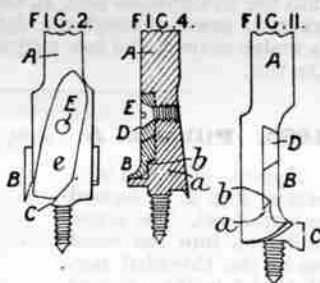
**Pliers.**—A tool of the nippers type, for cutting the wire, cord, or other fastenings of corked bottles, has two semi-circular or oval cutters or shears attached to the undersides of the curved jaws to cut the wires &c. immediately above the bottle mouth when the cork is gripped by the jaws. The handles may be hinged at one end or near the middle, and may be provided with a number of pairs of various sized jaws and cutters or terminate in two pointed blades for cutting the wires &c. singly or in two serrated jaws for withdrawing corks. A stud on one handle working in a recess in the other guides the handles.

**880. Bishop, W.** April 22.

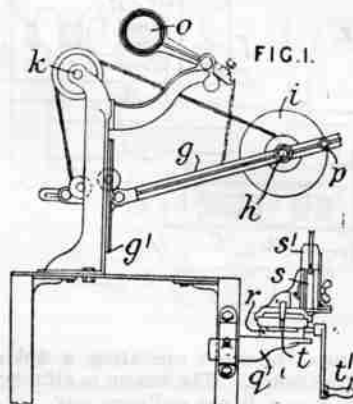
**Files and rasps.**—In order to make wooden reels of uniform size, after being turned in the usual way, files cut to the shape of the reels, as shown, are applied to them until the ends of the file touch the bed or rests of the lathe placed for the purpose.

**909. Clark, W. A.** April 24.

**Wood - boring bits** are provided with adjustable cutters, secured by plates and screws, the cutting-edges being arranged so that all chips are delivered on the same side of the shank. A cutter B, Figs. 2 and 4, is supported by a



groove b, on a V-shaped ledge a on the shank A, and is kept firmly in place by the bevelled plate D and screw E, the upper bevel being undercut. In this case chips from the stationary cutter C are delivered on the opposite side of the stock to the movable cutter, the stock being cut away at e to allow the chips to pass, thus necessitating more metal on the cutter B side and throwing out the cutter edge too far from the centre of the stock. To obviate this, the lip C may be formed as shown in Fig. 11, all the chips being delivered on one side, the other side being left entire and the cutting edge of B being brought back nearly to the centre. A longer cutter is made so that the edge stands a little higher in the stock, in order to obtain a proper shoulder and depth of cut, or the edge of the cutter may be made inclined to the groove b, in the latter case the point of the cutter always works at the same depth and the depth of the shoulder varies as the diameter of the hole.

**1032. Clark, W.** [a communication]. May 7.

**Saws, sharpening.**—Saws are sharpened by bringing a revolving grinding-surface between the teeth. The saw is clamped between wooden jaws  $s'$ , on a carriage  $s$ , which is moved along a guide  $r$  by means of a chain and sprocket wheel  $t$ , attached to a handle  $t'$ . The guide  $r$  can rotate horizontally on a table  $q$ . The emery or other grinding-wheel  $i$  is mounted on a shaft  $h$ , revolving in centres, and is driven by a band from a shaft  $k$ , and is carried on a swinging frame  $g$ , connected to a counterweight  $o$  by means of an adjustable chain. The frame  $g$  is attached to a ring  $g'$  which can be set to any angle. The saw having been clamped, the wheel  $i$  is brought down by a handle  $p$ , and the frame  $g$  is adjusted to the required height. The sharpening-surface is then set parallel to one side of the teeth by means of the ring  $g'$ . Every alternate tooth is then ground, the saw being moved forward by the handle  $t'$ , the remaining teeth being sharpened by turning the saw round in the clamps and repeating the process. In the case of circular saws, the table  $q$  &c. is replaced by a vertical slotted bar, the saw shaft being mounted in a groove in a horizontal bar which carries a tongue adjustable as to height in the vertical slot.

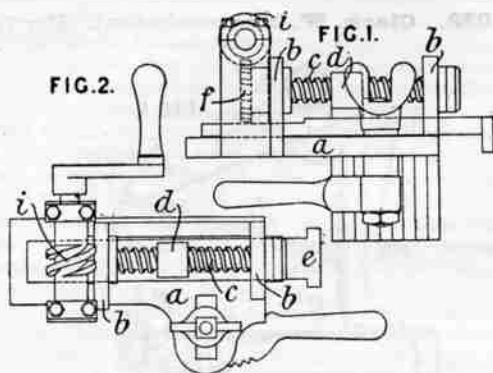
**1111. Brown, J.** May 19.

**Forging-tongs.**—

A pair of tongs  $x$ , closed by a screw  $5$ , is mounted to swivel on a wheel-tracked  $w$ , and is used for transferring balls, blooms, ingots, &c., between furnaces, rolls, hammers, &c.

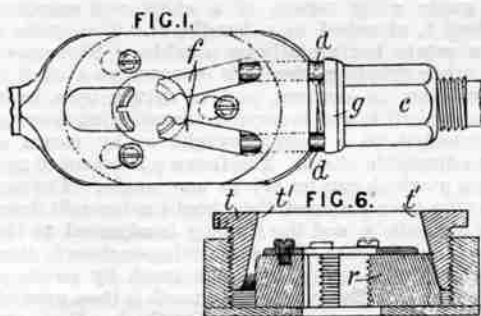
**1181. Cheadle, G.** May 26.

**Cramps.**—Relates to flooring cramps. A screw  $c$  is supported in uprights  $b$  on the base plate  $a$ . To the screw is attached a worm-wheel  $f$  operated



by the worm *i*, the screw operating a nut *d* connected to the ram *e*. The cramp is attached to a joist, while in use, in the ordinary way.

**1318. Chatwin, T., and Taylor, C.**  
June 10.

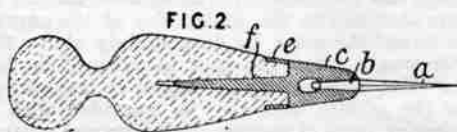


**Stocks and dies.**—Two of the three dies *f*, Fig. 1, of a screwing-stock are advanced in radial or nearly radial grooves by means of two sliding bolts *d*, a washer *g*, and a nut *c* threaded on to one of the handles, by means of a cross-piece engaging the two dies and the end of one handle which is threaded through a hole in the centre part of the stock, or by means of two bolts *d* a washer *g* and a set-screw threaded into a hole in the centre part of the stock, the handles being then attached to the sides instead of to the ends of the centre part. The three dies *r*, Fig. 6, are advanced by means of a ring *t*, which is threaded into the stock and has an inclined inner face *t'* to engage the inclined ends of the dies. The circumference of the flange of the ring is notched to take a clawed spanner. The dies may be withdrawn by springs or by the advancing mechanism, which is suitably modified.

**1320. Davis, W.** June 10.

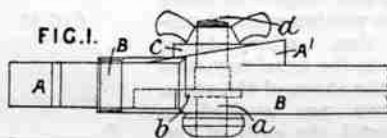
**Handles; nailing, hand tools for.**—The blade tangs *b* of carpenters' awls, and shoemakers' saddlers' or other pegging awls &c., whether of a square, round, oval or other section, are tapered to fit pads or sockets *c*, which may be provided

with projections to pass up the centres of the handles *f*, and with ferrules *e*, but the ferrules may be dispensed with or be separate and encircle the handles only or parts of the handles and parts



of the sockets. The blades are detached by forcing a nail or other tapered instrument through the transverse hole. The sockets may be of malleable or cast iron, german silver, &c., and the handles may be hollow to contain spare blades.

**1537. Smith, R.,** [a communication]. July 8.



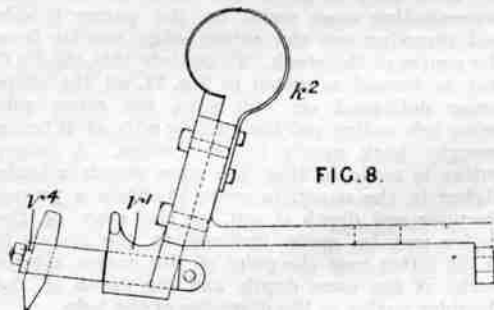
**Pincers.**—The slipping of the pivot pin *a* in the elongated hole in the curved-jaw part *A* of an adjustable pair of pipe tongs is prevented by forming an incline *A'* on the back of the part, or by serrating the back of the part and the underside of the washer *c*. A collar *b* on the pin is recessed into the straight-jaw part *B*, the pin is flattened where it passes through the slot, and the washer *c* is wedge-shaped, and has projections which enter the slot.

**1885. Pilbeam, A.** Aug. 19.

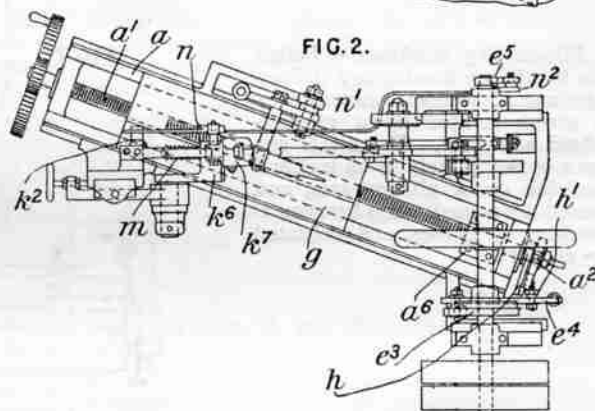
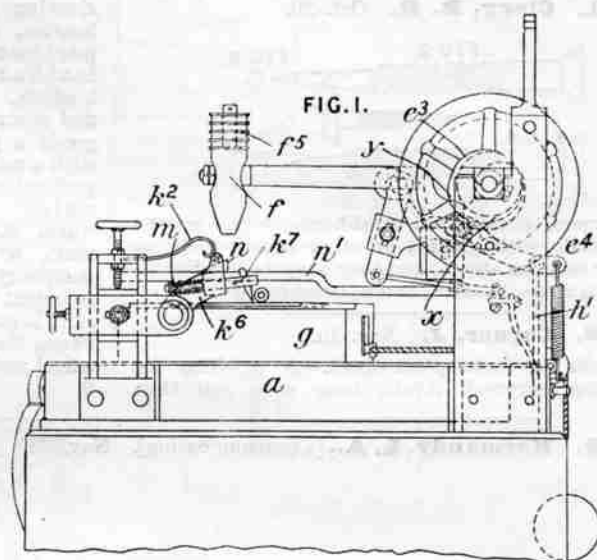
**Augers.**—The end of a screw, Fig. 2, is formed as a brad-awl. The screw is driven into the wood up to the threaded portion, and is then turned by means of a screw-driver. The brad-awl end may be also applied to hooks, studs, rings, &c.



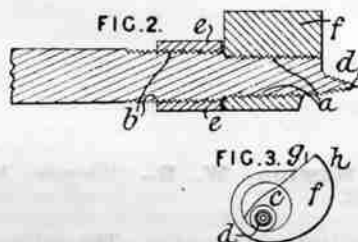
**1893. Preston, F., and McGregor, W.**  
Aug. 20.



**File-cutting machines.**—In a file-cutting machine similar to that described in Specification No. 815, A.D. 1858, the chisel is gripped between the two parts of the clamp or vice  $k^1$ , or in a recess by means of a bridle  $v^1$ , and the holder is free to swivel in a slide  $v^1$ , or in a socket  $k^6$ , pivoted below the file table. The chisel may be additionally secured in the clamp  $k^1$  by a pin or cottar, and the clamp kept in position by a spring  $m$ , surrounding the clamp shank or arranged as described in the said prior Specification. The holder is depressed by a spring  $k^2$ , and is raised by the incline  $n$ , the rod  $n^1$ , the lever  $n^2$ , and the cam  $e^5$  while the table  $g$  carrying the file is advanced along the bed  $a$  by means of the screw  $a^1$ , ratchet-wheel  $a^2$ , pawl lever  $h$ , link  $h^1$ , lever  $e^4$ , and cam  $e^3$ , this cam having a slightly eccentric part  $x, y$ , which imparts a forward "pressure" to the table after the same has been advanced, and prevents the hammer  $f$  from loosening or reversing the motion of the screw  $a^1$ . The table is also acted upon by the customary weight, and the screw is gripped in a leather-lined friction brake  $a^6$ . To diminish the rebound of the hammer  $f$ , a number of loose weights  $f^1$ , with discs of leather interposed, are affixed to it.

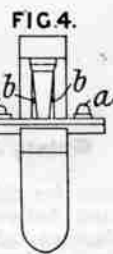
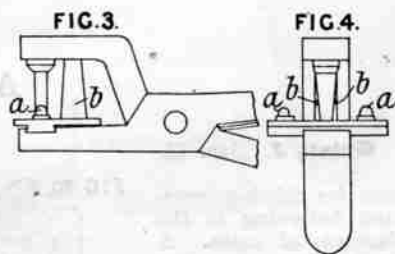


2023. **Tucker, W.** Sept. 7.

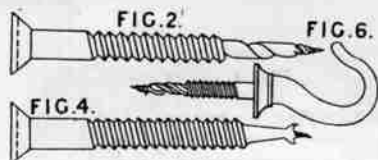


**Wood-boring bits.**—The shank of a variable boring-bit is threaded preferably with right and left handed screws  $a$ ,  $b$ , for the reception of an eccentrically-bored cutter  $f$  and the locking-nut  $e$ . The screw centre  $d$  is eccentric to the axis of the shank. The shank has a cutting edge  $c$ , and the cutter has cutting and creasing edges  $g$ ,  $h$ .

2046. **Wright, J., and Wright, J.** Sept. 9.



**Punching-pliers** for punching and setting eyelets. The lower jaw has a die plate carrying spacing-studs  $a$  for gauging the distance between the eyelet holes, and also a guide pillar  $b$  for regulating the depth of setting from the edge.

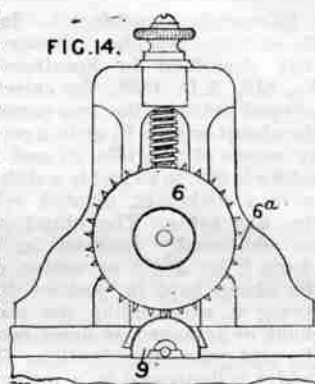
**2341. Clegg, R. D.** Oct. 20.

*Augers, gimlets, and wood-boring bits.*—Screws are made with gimlets or other boring-tools at their ends, as shown, and they may be applied to hooks, rings, handles, knobs, brackets, &c.

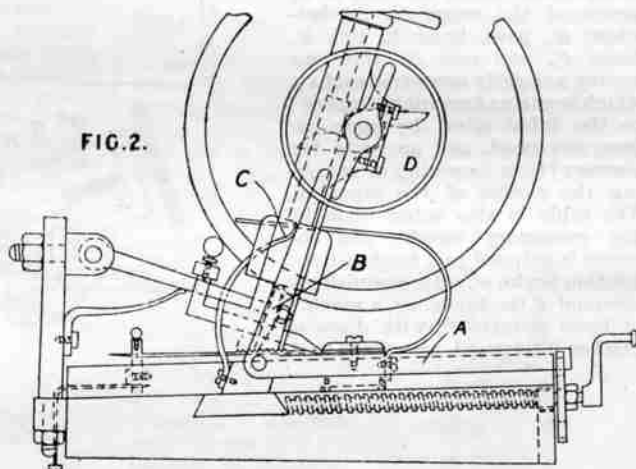
**2518. Corner, J.** Nov. 10.

*Tools for setting-out work.*—A machine for making screwed rivets from wire and then

riveting parts of boots, shoes, portmanteaus, leather hose, buckets, harness and other leather goods is provided with a marking or perforating tool which has a wheel 6, having teeth 6<sup>a</sup> on its periphery adapted to indent the work as it is passed between the toothed wheel and a roller 9.

**2719. Normandy, L. A.,** [a communication]. Nov. 29. [Provisional protection only.]

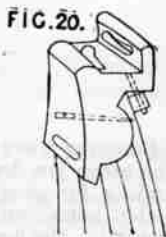
*File-cutting machines.*—Rolled file blanks are fixed upon a sliding-carriage A, which is traversed by a screw rotated by a ratchet-wheel and pawl. The file is cut by a chisel B, held in an inclined position on a pivoted arm, and struck by a small drop hammer C working in guides, and actuated by cams D.



A.D. 1859.

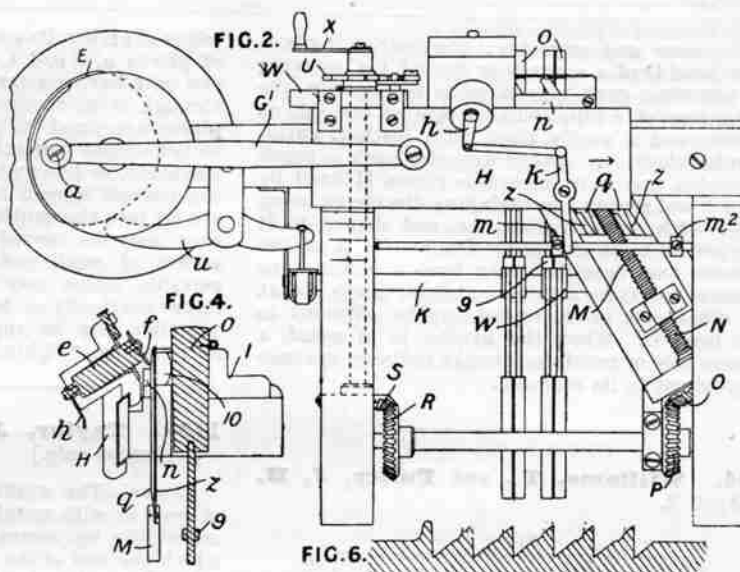
**115. Grist, J.** Jan. 13.

*Planes for chiming, crozing, and hollowing in the manufacture of casks.* A combined plane has the necessary cutting-irons set in one stock, as shown, and has an external roller for bearing on the outside of the cask.

**205. Newton, W. E.,** [Whipple, M. D.]. Jan. 22.

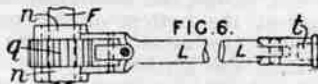
*File-cutting machines; files.*—The cutting of files is effected by a circular bevel-edged cutter *f*, pivoted eccentrically on a shaft *e*, in a slide *H*, which is reciprocated past two or more blanks *q* by the rod *G* and crank *a*. The shaft *e* is oscillated by the arm *h*, lever *k*, and stops *m*, *m*<sup>2</sup>, to move the cutter out of operation during the return stroke and *vice versa*. The cutter may be arranged to take off at each cut the rough or

jagged edge of the previously formed tooth as shown in Fig. 6 thus forming an improved tooth. The blanks *q* are placed in contact with the soft metal shields *z*, and with the block *M*, and are passed through inclined holes in the block *I*. They are supported in the slots by the upturned edges of the shields or by pins in the shields. The wedges *o*, two for each blank, are allowed to fall and grip the blanks between the plate *n* and the convex backed blocks *10*, and after each cut is made, the wedges *o* are lifted by the stops *9*, tappets on the shaft *K*, lever *u*, and cam *E*, and the blanks are fed forwards along with the block *M*, by means of a screw *N*, gearing *O*, *P*, *R*, *S*, a ratchet-wheel *U*, a pawl lever, and an incline *W* on the slide *H*. The block *M* is lowered again by means of the handle *X*, the pawl meanwhile



being held out of action. As the face of the file is pressed against the plate *n* during the cutting-operations, the depth of the cut does not depend on the thickness of the file.

**373. Burt, H. P.** Feb. 10.



*Spanners and wrenches.*—Railway vehicles are fitted with an apparatus for moving them by hand when shunting. The mechanism is operated by a ratchet lever *L* in the eyes *n* of which is mounted the ratchet-wheel *q* which has an opening to fit the shaft *F* in the eyeleted fork *n*. The other end of the lever *L* carries pivoted to it the socket *t*, so that leverage may be applied by the handle *L* if necessary. The end may be formed as a spanner if desired.

**442. Gray, G., [Hyde, J.]** Feb. 17. [*Provisional protection refused.*]

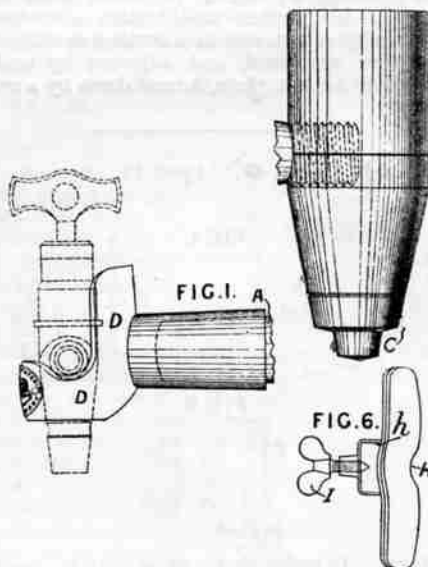
*Spanners and wrenches.*—The adjusting-screw of a wrench is carried by a spindle which is eccentrically mounted on a fixed pin, and carries a thumb-piece by which it may be turned to throw the screw into or out of gear with the rack on the shank. When the wrench is for tubes, bars, &c., an auxiliary jaw is pivoted at the centre of the sliding-jaw so as to be capable of tilting slightly and gripping the pipe &c. when the wrench is moved relatively to the pipe.

**496. Russell, S.** Feb. 23.

*Handles.*—The handles of knives and other articles are made by stringing suitably-shaped pieces of ivory, cane, bone, fancy woods, glass,

porcelain, or papier mâché, on a piece of metal, horn, or other substance of the shape of the handle required. The pieces of ivory, &c. are secured with cement or glue, and, at each end, by ferrules, nuts, screws, pins, &c.

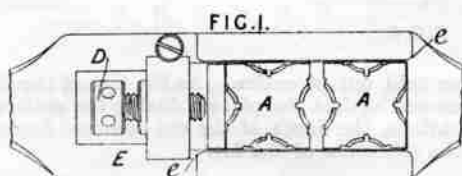
**645. Hurst, C. H.** March 14.



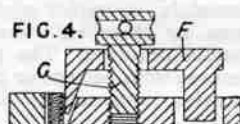


*Spanners and wrenches; combination tools.*—The head D of a spanner or wrench for inserting or removing cask taps is made to encircle the lower part of a tap, and abut against one side as shown, and is partly lined with leather, gutta-percha, cloth, &c. Other wrenches such as coach wrenches may have removable pieces H fixed by clips h and screws I to their jaws, the pieces being faced with cloth, leather, &c., and shaped to fit the article to be gripped. The handle A of the wrench first described may have a mallet with a metal end C for driving in bungs, cocks, &c. at its other end, or the mallet may be adjacent to the head D. When the handle is of metal, a square hole or notch to act as an ordinary spanner may be cut in its rear end.

**834. Williams, T., and Fuller, J. H.**  
April 2.

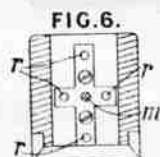
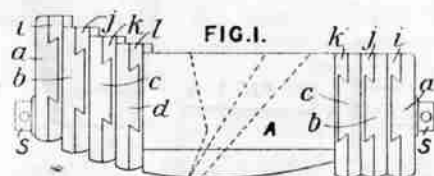


*Stocks and dies.*  
—Dies are made square with four cutting-faces. Fig. 1 shows such a pair of dies A, retained in the stock by a cover plate, sliding in grooves e.



The propelling-screw D and cross-bar E may be of the kind described in Specification No. 1035, A.D. 1855. In an improved propelling-arrangement, a wedge F, Fig. 4, is forced down by a screw G. In another modification a wedge is drawn up by a nut, and in a further modification three dies are used, and adjusted by wedges attached to a cover plate, forced down by a screw or screws.

**946. Abeillou, G.** April 15.



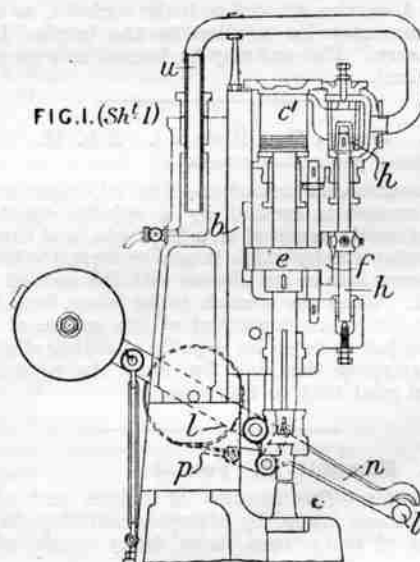
*Planes.*—In order that a plane may be used for the insides and outsides and round the curved

edges of arches, its ends are composed of a number of pieces a, b, c, d, i, j, k, l, dovetailed together, and each having a vertical and a horizontal slot through it to receive a screw S by which the pieces are fixed in position after having been moved either vertically, as shown at one end of the plane, or horizontally. The screws S engage the central tapped holes in the plates m which are let into the middle part A of the plane, but they may be moved into other holes r when arches of small radii are being planed. The movable pieces may be arranged to be moved either vertically or horizontally only. The same principle may be applied to ploughs, and planes for grooving, "lightening," moulding &c.

**1439. Taylor, J.** June 16. [Provisional protection only.]

*Planes.*—The working parts of planes entirely of wood or with metal bottoms and sides are made adjustable by means of screws. In a plane in which the bed of the iron is hinged near to the sole, the inclination of the bed is adjusted by a screw working in a fixed nut, and carrying a worm wheel meshing with a screw mounted transversely on the back of the bed and having a milled head. The transverse screw also operates a pinion on a screw mounted vertically on the back of the bed and engaging with a half nut on the back of the iron. The iron and iron bed are locked in position by a pivoted wedge, the lower end of which is forced against the bottom of the iron when a screw through the upper end of the wedge is forced against the top of the iron. The two motions described may be made independent. The front part of the sole is adjustable to alter the width of the plane mouth.

**1607. Schwartzkopff, L., and Philippson, F. C.** July 6.

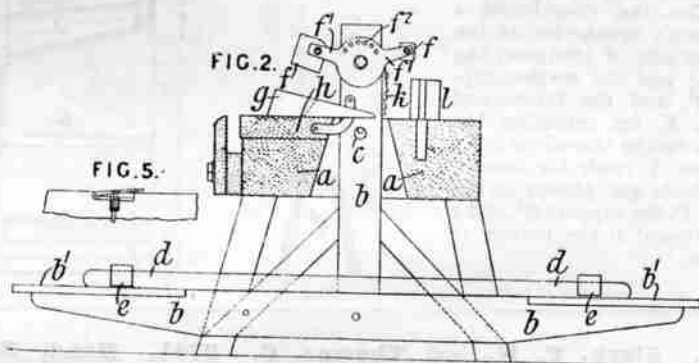


**File-cutting machines.**—A steam hammer which always makes a stroke of a fixed length and consequently delivers a blow of the same force comprises a steam cylinder  $c^1$  mounted upon a vertically sliding frame  $b$  which is adjusted and counterbalanced by a weighted hand-lever and fixed by a band brake  $p, n$ . The steam pipe  $u$  slides in a stuffing-box. The oscillating dis-

tributing-valve  $h$  is worked by an inclined cam  $f$  on the crosshead  $e$ . The piston is raised by a spring. The above apparatus may be used for cutting files, being mounted in an inclined position above the table carrying the file, which is fed by an adjustable ratchet gear worked by the steam pressure controlled by the distributing-valve  $h$ .

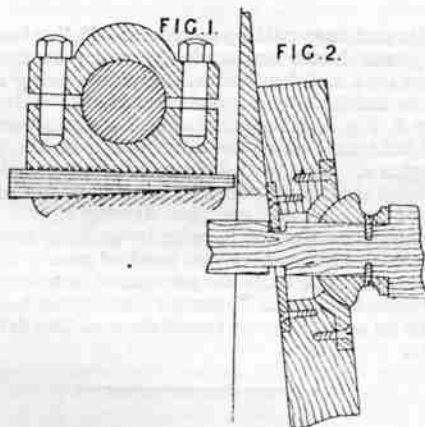
**1632. Duppa, T. D. July 8.**

**Benches, work; bench fittings; vices.**—Through a central hole in a carpenter's bench is passed the upright of an inverted T-shaped lever  $b$ , pivoted at  $c$  just below the surface of the bench, and fitted with platforms  $b^1$ , on either of which the workman stands, and with counterbalance weights  $e$  running on rails  $d$ . The work may be gripped between an adjustable wedge  $g$  and a block  $f$ , fixed to the lever, or mounted between pivoted arms  $f^1$ , which are locked in any position by a pin pushed through a pair of the holes  $f^2$ . The part  $h$  of the bench on which the wedge  $g$  is fixed may be slidable as shown, and form the movable jaw of a vice. On the other side of the upright are a block  $f$  and teeth  $k$ , between which and one of the four different-lengthed arms of the rotatable stop  $l$  the work may be gripped. There are a number of holes in the bench to receive the stop  $l$ . A plan-



ing-table is secured by brackets to the edge of the bench, and fitted with a hinged dog as shown in Fig. 5, which is pressed upwards by a spiral spring and adjusted by a screw. In a recess between the bench and table, wood to be planed on edge is fixed by wedges. Another table for sawing or chopping purposes is secured to the bench, and a knife sliding in a dovetail groove in a projection from the bench, is provided for cutting up brushwood &c. by the aid of a wooden mallet.

**1643. Hutchins, E. F. July 11. [Provisional protection only.]**



**Vices.**—To enable a tapered article to be gripped, one or both jaws of a vice or other tool are mounted on ball-and-socket joints, the socket embracing the ball on both sides as shown in Fig. 1, or on one side only as shown in the carpenters' bench vice, Fig. 2, the ball and socket being held in engagement by a groove in the screw and a plate.

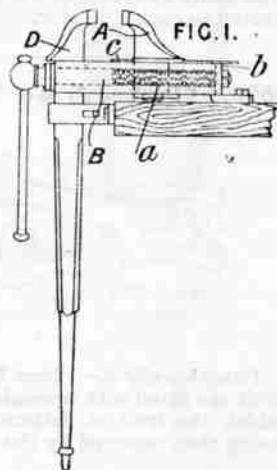
**1941. Chamberlain, A. P. Aug. 25.**

**Drawings to Specification.**

**Files and rasps.**—For rasping cork, bark, and other substances, holes are punched in thin steel plates so as to raise a burred surface which can then be supported on a drum and rotated.

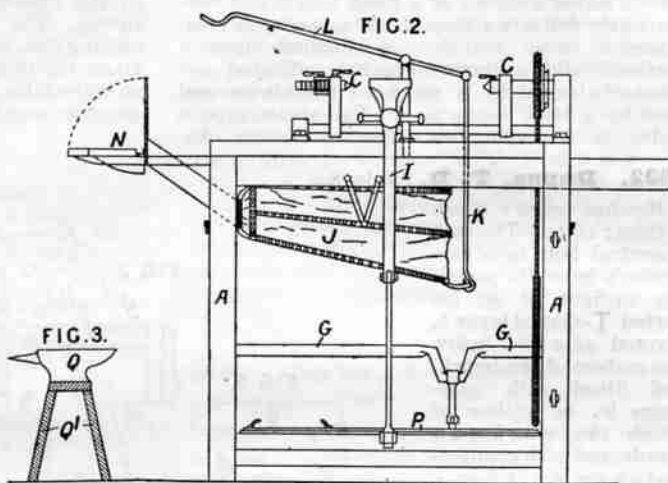
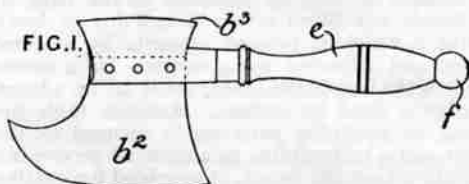
**1977. Drury, R. F., and Drury, E. Aug. 30.**

**Vices.**—The movable jaw  $A$  of a wrought-iron vice slides on the two side bars  $B$ , which are welded to the fixed jaw  $D$ , and are connected together by a plate  $b$ . The plates  $c$  prevent filings from falling on to the screw which rotates freely in the jaw  $D$  and the plate  $b$ , and engages a tapped hole in the part  $a$  of the jaw  $A$ . The leg, if there is one, is in one with the jaw  $D$ .

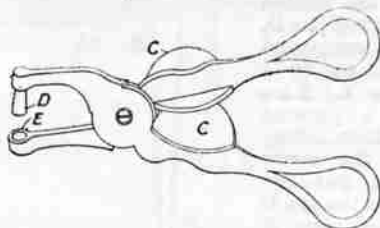


**2260. Dodd, T. H. Oct. 5.**

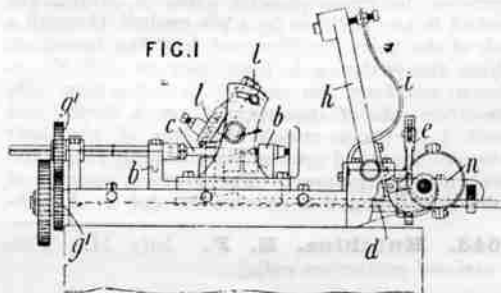
*Benches, work.*—A wooden packing-case A with removable panelled sides is used as a portable carpenter's bench, and also as a support for a small lathe C and a smith's forge N. The bellows J and the driving-gear G of the lathe are fixed inside the box, but the forge, the lathe, the vice I and a carpenter's bench-vice at the opposite side of the case, the anvil Q and its wooden support Q<sup>1</sup>, and the levers and rods L K for actuating the bellows can be stowed away in the case A ready for transit. Small tools are placed in the drawer P, the support Q<sup>1</sup>, and a compartment at the bottom of the box.

**2423. Clerk, F. N., and Thomas, C. Oct. 22.**

*Axes; handles.*—The body of a double-bladed cleaver is slotted and in one slot is riveted a thin steel knife  $b^2$ , and in the other is welded a steel blade to form a chopper  $b^3$ , or the body may be welded together and steeled to form the chopper. When there is only one blade, it is riveted or welded between the sides of a U-shaped body. The body may be narrowed down to form the tang which is passed through the handle  $e$  and a washer  $f$ , or may be flattened out to about the same width as the handle and a strip of wood then riveted to each side of it.

**2529. Clarke, J. A. Nov. 7.**

*Punching-pliers.*—Pliers for stoning soft pulpy fruit are fitted with squeezing-surfaces C, between which the fruit is flattened, the exposed stone being then removed by the punch D and die E.

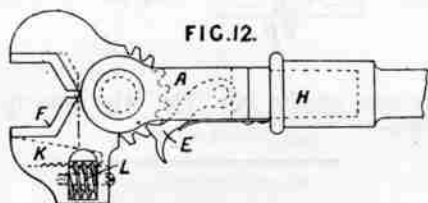
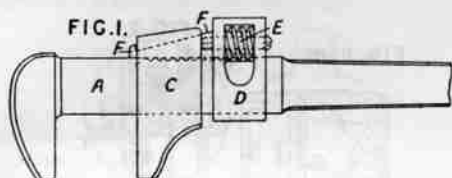
**2741. Bond, R., and Hayhurst, W. Dec. 3.**

*File and rasp cutting machines.*—Roller temples for power looms are made by "rasp-cutting" a spiral on a metal cylinder, the points being afterwards finished by a countersunk die. Tilt hammers  $h$ , Fig. 1, with spring stops  $i$  strike adjustable tool-holders  $l$  so as to raise points on the blank temples  $c$ . The work-holder  $b$  is advanced by a screwed shaft  $d$  actuated by a ratchet and pawl  $e$  raised by a cam on the driving-shaft. The machines are worked in pairs by gearing together the shafts  $d$  from which also toothed gear  $g^1$  rotates the work. The tools are prevented from dragging after the blow by a T-piece raised by an inclined plane advanced by an eccentric  $n$  on the driving-shaft.

**2904. Ferrabee, J. Dec. 20.**

*Spanners and wrenches.*—The movable jaw C, Fig. 1, of a screw-wrench or spanner is adjusted by means of a worm E and a rack. The rack may be on the stem A and the worm mounted in a slide D from which a wedge-shaped projection with one lug or a parallel projection with two lugs

extends and engages the jaw C as shown, but the slide D may be rigidly connected with the jaw C, or the part D may be fixed and the rack formed



on an extension of the wedge F. The worm may be mounted so that it is thrown into and out of engagement with the rack on its spindle being

partially rotated. Both jaws may be movable or fitted with packing strips F, Fig. 12, and one or both strips F may be adjustable by means of a wedge K and a worm L. The handle A may be pivoted to the head, and carry a pawl E to engage the notched quadrant of the head. A lengthening-socket H may be fixed on the handle. A shield for the rack may be carried by the slide D, Fig. 1.

**2955. Maryon, W.** Dec. 27. [Provisional protection only.]

*Spoke-trimmers.*—Shoulders and pins on the ends of ladder rungs are formed by a double-stocked spoke-trimmer worked by two hand screws which adjust the stocks. The separation of the stocks is aided by spiral springs round the screws and on one of them a plane iron and wedge are fitted to size the pins. The turning is effected by steel plates with circular cutting-edges fixed on the stocks and the length of the pins is regulated by a slotted iron stop adjusted by a screw.

## A.D. 1860.

**20. Klein, J. L. E., and Roger, J. P.** Jan. 4. [Provisional protection only.]

*Vices; pincers.*—A pair of pincers or some other tool holds the shoe or other work. It has a handle which can be inserted into any of a number of holes in a globe and secured by a set screw. The globe is rotatable and vertically adjustable on a rod.

**89. Burley, R.** Jan. 12.

FIG. 8.



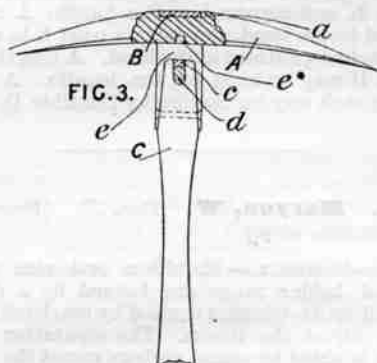
*Handles.*—A handle for a hammer, mallet, pick, or similar tool is strengthened by a metal rod or

rods B, secured in position by nuts or by a nut and the fixing wedge for the tool head. The handle may be in sections C threaded on to the rod, or may be made of a composition surrounding such a rod, or the rod may be replaced by a hollow sheath or handle, which may or may not be filled with wood or composition.

**198. Banks, T.** Jan. 26. [Provisional protection only.]

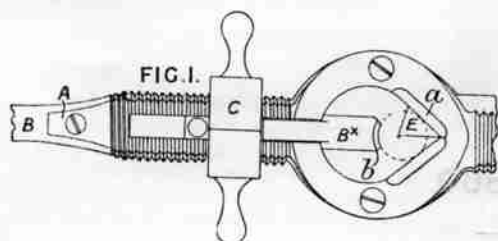
*Pincers; spanners and wrenches.*—One claw of a pair of gas-pipe tongs which may be used for rods or bolts or as a spanner, is made adjustable by connecting it by a pin joint with an internally-threaded boss, working on the screwed part of the handle near the end carrying the other claw.

- 644. Newton, W. E.,** [Emerson, J. E.].  
March 9.



*Handles.*—A pick, axe, or other tool is secured to its handle C by a strap B, and a gib and cottar d, c, passed through the sides of the strap and the metal head e of the handle. The tool may be recessed at a, e\* to receive the strap and a projection from the head e, or may have a projection to take into a hole in the head e, or the strap may be welded to or made in one with the tool.

- 869. Fuller, J. H., and Davidson, W.**  
April 5.

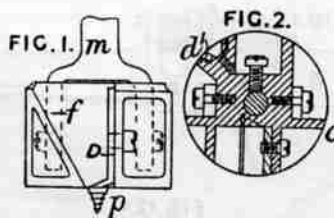


*Combination tools.*—In a tool for cutting and screwing pipes, rods, &c., the cutter E and the stop B\*, for holding the work up to the inclined faces a, are advanced by nuts C in grooves between the upper and lower parts A, B of the stock. There may be a horizontal or inclined projection b on the stop B\* to prevent the tool from slipping, or to advance it along the work.

- 1055. Clark, W.,** [Coulouvrat, G., and Genon, A.]. April 26. [Provisional protection only.]

*Wood-boring bits.*—The scoring-cutter d', the leading screw p, and the main cutter D, of a wood-boring bit are adjustably secured by screws in a box c which is fixed by screws to the forked end on the stem m. In larger bits, the end of the stem

is shouldered instead of forked, and the screw p is replaced by a projecting tube of the same size

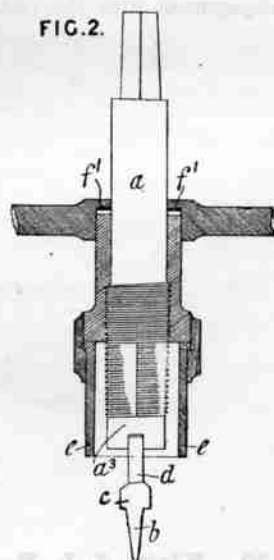


as the next smaller bit. The chips pass up the incline f.

- 1094. Upward, A.** May. 1.

*Combination tools.*—

A tool for drilling and tapping gas and water mains while under pressure is shown in Fig. 2. The tap a carrying the double cutter b, d, is forced towards the main by a screw in a crosshead clipped to the main, and is rotated by a ratchet brace during the drilling operation, and by a wrench during the tapping operation. The hole made by the drill b is plugged by the cylindrical part c, and the enlarged hole made by the cutter d by the part a<sup>3</sup> of the tap. When the cutter d breaks through the pipe, it is withdrawn by screwing the cylinder c up to the main and is then rotated and slowly advanced to remove the burr from the hole. The tap a is screwed through the cylinder c and into the main.



- 1110. Dixon, A.** May 3. [Provisional protection only.]

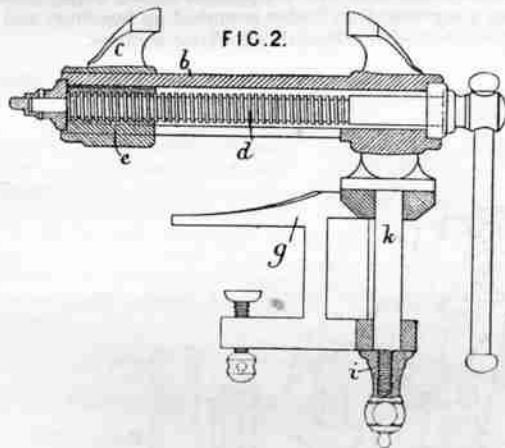
*Stocks and dies.*—The movable screwing-dies are advanced and retracted in a stock by means of a screw fixed to each die and a nut which can only be rotated. When there are two dies the nuts may gear with each other or with a toothed wheel on one of the handles, the screws in the "former" case being right and left handed. The dies are made cylindrical and the stock is bored out to receive them.



**1212. Mennons, M. A. F.,** [Paillard, A.]. May 17. [Provisional protection only.]

*Handles.*—A handle for a file, chisel, or other similar tool has two jaws, tapered off externally so as to form when closed a flattened cone. The jaws are freely suspended "to" a collar, which is screwed into the socket of the handle to cause the jaws to grip the tool. A wire spring in the wooden handle centres the tang.

**1221. Ibbotson, A. B.,** [Powers, H.]. May 17.



*Vices; spanners and wrenches.*—The movable jaw of a screw-adjusted wrench or spanner, and the back jaw *c* of a vice which is made the movable one, are arranged to slide on cylindrical tubes *b* solid with the fixed jaws, the tube being slotted, on the underside in the case of the vice, to admit the nut *e* which fits the interior of the tube and forms a part of the movable jaw. The washers on the vice screw *d* are recessed into the ends of the tube *b*, which is fitted with a pivot pin *k* and a nut *i* for clamping it in the bench bracket *g*; or the two ends of the tube may be secured to a plate which is screwed to the bench.

**1448. Spence, W.,** [Vanderburgh, G. E.]. June 13. Drawings to Specification.

*Files and rasps.*—Consists in using in the preparation of files or rubbers, a fluid silicate, obtained by acting upon a siliceous substance like sand with superheated steam and an alkali, such as soda or potash.

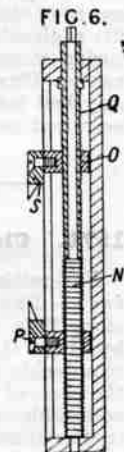
**1472. Henderson, C.** June 16. [Provisional protection only.]

*Cramps.*—The ram or bolt of a flooring or bench cramp moves on rollers, and is operated by means of a wedge which is moved transversely to the ram guides by a screw and winch handle. A link

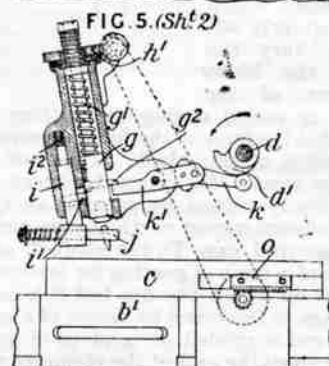
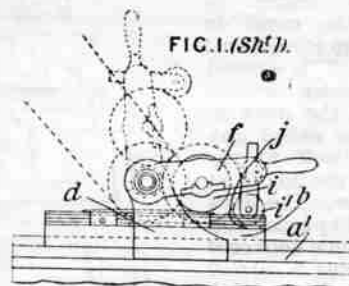
connecting the wedge and ram ensures the return of the latter. On the underside of the cramp bed are two plates, one being inclined to the other, and fitted with a sliding wedge between which and the other plate a joist is gripped. This wedge is operated by a rack and pinion.

**1475. Stone, E.** [Ahsbohs, J.]. June 16.

*Vices.*—In order that the dogs *P, S* of each vice of a veneer-cutting machine may be independently adjusted from one end of the vice, the stem of one screw *N* passes through the other screw *Q* which is hollow. The dogs are pivoted to the nuts *O*.



**1500. Preston, F.** June 20.

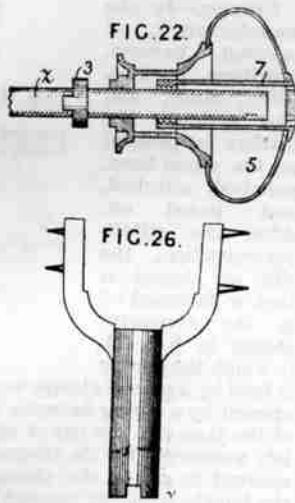


*File and rasp cutting machines.*—The tool to be cut, and a templet *j*, Fig. 1, are fixed on a slide *b*,



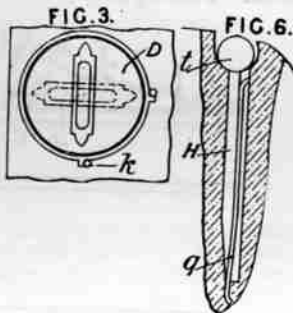
1573. Whitehouse, J. June 29.

**Spanners and wrenches.**—The points on the instrument shown in Fig. 26 are inserted in holes in the head of the hollow screw 7 forming part of the door knob 5, Fig. 22. The tubular part of the instrument is used for turning the nut 3.

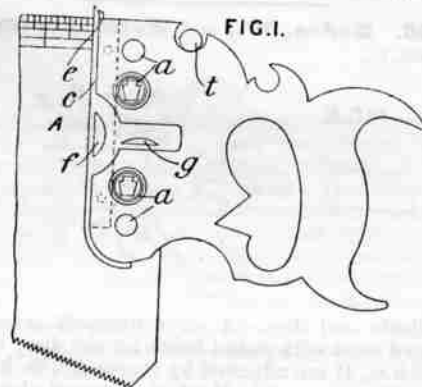


1648. Disston, H. July 9.

**Combination tools.**—Two metal strips *c*, to form the butt of the square of the combined saw and square described in Specification No. 2509, A.D. 1857, are riveted to the saw blade *A* independently of the handle, and are pointed at *e* to form a scriber for use in conjunction with the straight graduated back edge of the blade. Two spirit tubes *f*, *g*, or a tube attached to a plate *D* which may be rotated between stops *k*, are mounted in the handle to form with the back of the blade a level and a plumbing-instrument.



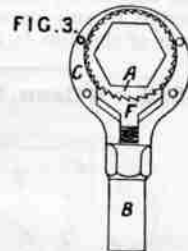
**Handles.**—The handle of the combination tool described above is preferably secured to the blade by tapered pins, threaded at one end and fitted



with nuts, and is bored to contain a marker *H* with a knob head *t*, the marker being retained by means of a spring *q*.

1863. Roberts, J. Aug. 1.

**Spanners.**—In a continuous or ratchet spanner, a ring *A* perforated to fit the nut or bolt &c. and formed externally with ratchet-teeth is let into the spanner head *C* and is rotated by means of a pivoted or sliding pawl *F* or by a pawl on the shorter end of the bell-crank handle *B* which is then pivoted to the head.



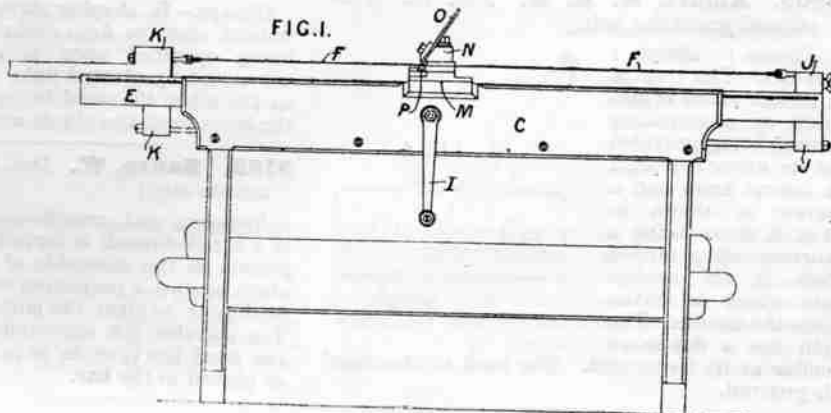
2261. Newton, W. E., [Pierce, W. P.] Sept. 17.

**Files.**—The rows of teeth of a round or a curved-faced file are arranged spirally, as shown, instead of exactly longitudinally.



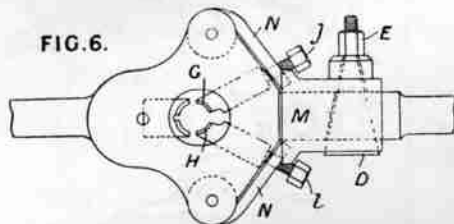
2275. Hunt, E., [Prale, T. A.] Sept. 19.

**Saws, setting.**—In a machine for removing inequalities from saw blades, the blade *F* is stretched between the fixed and the adjustable crossheads *J*, *K* of a frame *E* which is reciprocated by a rack and pinion and the handle *I*. At the centre of the bed *C* is mounted a holder *N* carrying a chisel *O* between which



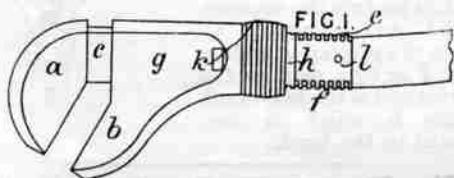
and a block P, adjustable in height, the saw is pulled. The holder N is moved transversely on the plate M between the strokes.

**2536. Eades, W., and Worstenholm, G.** Oct. 17.



*Stocks and dies.*—A screwing-stock is cast or forged solid with radial holes for the dies, two of which G, H are adjusted by screws j, i, in hinged flaps N, or in a slide M which is moved along one handle by a wedge and nut D, E. The slide M may be replaced by a nut on the handle, or on a pin between, and at right angles to, the handles, the nut in the latter case being fitted with an adjustable stop or set screw. This set screw and the screws i, j may have graduated heads. The wedge D may have two inclines engaging the ends of the dies G, H, and have a nut at each end.

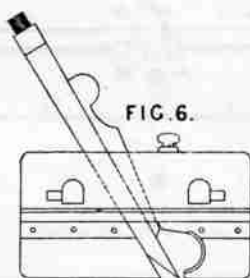
**2638. Wilson, T.** Oct. 29.



*Spanners and wrenches.*—The jaws a, b of an adjustable spanner or screw-wrench are inclined to the body c, and the socket g of the movable jaw b is extended towards the handle and made or fitted with side pieces h, between the ends of which and the socket is the nut k, engaging with the threads e, f on the edges of the flat body. A pin l limits the motion of the jaw b.

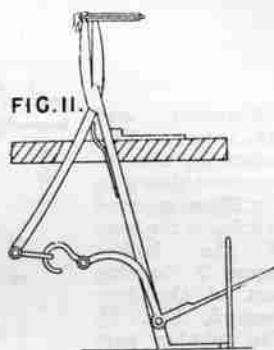
**2805. Amott, G. R. B.** Nov. 15. [Provisional protection only.]

*Planes ; chisels ; handles.*—The iron of a plough plane is also used as a mortising chisel, being provided at its upper end with a lateral knob and a screw as shown in Fig. 6, there being a corresponding tapped hole in the conical pin which is driven into the handle. The pin has a flange or collar at its larger end. The back of the chisel is grooved.

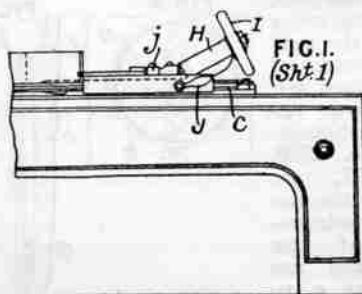


**2857. Myring, C.** Nov. 21.

*Cramps.*—In the manufacture of covered harness, furniture, buckles, slides, rings, and like articles, the leather is pressed on the metal form, polished, stitched, and pared off. After the stitching-operation, the silk or thread is tied or fastened off in the apparatus shown in Fig. 11, in which the buckle is held by a pair of clamps worked by a treadle and opened by a spring between the jaws. The beaks of the jaws clip the bar of the buckle at the part left uncovered for the tongue. The treadle being secured in a rack, the thread on the top side of the buckle is pulled through to the underside and tied.



**3002. Clark, W., [Mareschal, J.].** Dec. 7.



*Vices.*—Wood to be planed is held between a fixed and a movable cramp H on the machine table, the cramp H engaging grooves c in the sides of the table and being locked in any position by clamps J. The hand-wheel I and the operating screw are connected by a universal joint j.

**3129. Hadfield, G.** Dec. 20. Drawings to Specification.

*Clamps.*—In shaping staves in the straight or unbent state to form casks or barrels, the wood being operated upon is clamped by a plate connected by pivoted links with a lever pivoted to the table, the wood being clamped by turning the lever until the pivots are in line.

**3195. Eades, W.** Dec. 31. [Provisional protection only.]

*Spanners and wrenches.*—The adjusting-screw of a screw-wrench is tapped into an angular projection on the underside of the movable jaw, and abuts against a projection on the handle which is filed away to clear the milled head of the screw. The movable jaw surrounds the handle bar, and the fixed jaw is made so as to be readily riveted or pinned to the bar.

A.D. 1861.

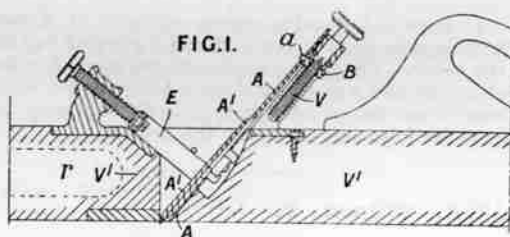
- 123. Coulter, W.** Jan. 16. [*Provisional protection only.*]

*Bench fittings.*—A hook or stop for a joiner's bench is arranged to be raised and lowered in a metal box by means of a screw and a screwdriver.

- 346. Thompson, N.** Feb. 11. *Drawings to Specification.*

*Tools for setting-out work.*—In boat-building, the under set of planking and the upper set of sheathing are fitted by hand on to the assembling form described in Specification No. 1359, A.D. 1858, [*Abridgment Class Ships &c.*, Div. I]. The parts are then removed, steamed, straightened, and used as patterns.

546. **Davies, G.**, [*Vendrand, J.*]. March 4.

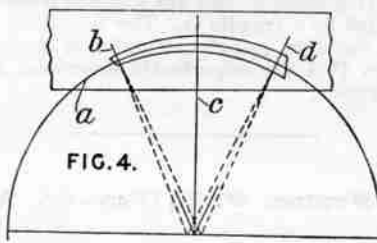


*Planes.*—The iron A of a plane or plough for wood or stone is adjusted longitudinally by a pin a, a nut B, and a screw V, the hole in the iron for the pin being elongated to allow of the lateral adjustment of the iron. The fixing-wedge may be replaced by a stirrup E and a screw, or by a bell-crank lever having lugs engaging a washer on the screw connecting the iron A and the break iron A<sup>1</sup>, and an operating-screw in contact with the top of the plane body V<sup>1</sup>. Grooves r for the fingers are made in the sides of the front end of the plane.

623. **Aston, J. W.** March 13.

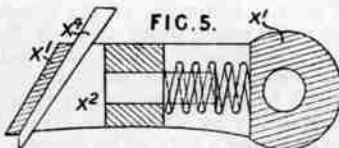
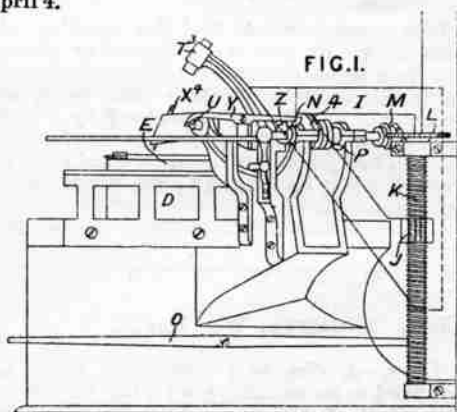
*Vices.*—A screw and box for a vice are forged or cast in steel or a mixture of iron and steel. The nut is enclosed in a hollow divided box of steel, iron, or steel and iron, and the parts welded together. The nut may be formed by coiling an angle-iron round a screwed mandrel and welding the overlapping flanges together, or, if stout angle-iron is used, the nut and the box combined may be similarly formed. The thread is afterwards trued up. Washers to form the ferrule are welded to the end of the box.

- 763. Spence, W.,**[*Broadwell, L. W.*]. March 27



*Tools for setting-out work.*—Curved furrows are marked out and formed on the operating-surfaces of millstones. The face of the stone having been divided into a number of equal parts by diameters, the lines for the furrows are marked out by the use of a curved rule, the length of which is a little less than the radius of the stone. As shown in Fig. 4, this rule is made by drawing a segment of a circle *a*, of radius equal to that of the stone to be furrowed; radii *b*, *d*, *c* are drawn from the end and middle points, and on each of these lines on each side of the circle, is measured half the width of the rule required at the point in question; circles are then drawn through the two sets of three points so obtained.

833. **Newton, W. E.**, [*Anden, W. van*].  
April 4.

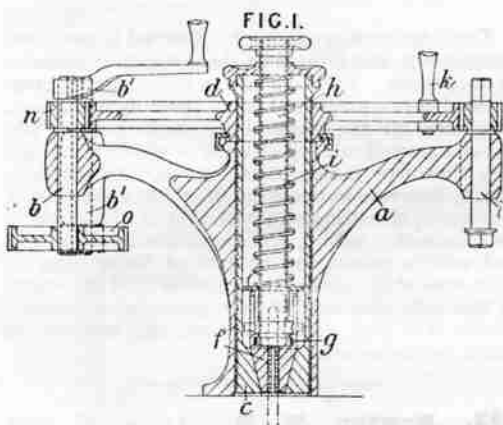


*File-cutting machines.*—Each tooth is cut by two or other number of light blows of a hammer T<sup>8</sup>, Fig. 1, upon a chisel X<sup>4</sup>, which is held by a spring-pressed block X<sup>2</sup>, Fig. 5, in its holder X<sup>1</sup> so that



the chisel may adjust itself to the surface of the file blank. The chisel holder is pivoted on a shaft U and is pressed upon the blank before the blow is struck by a cam Z and lever Y. The bed E carrying the blank is arranged obliquely upon a slide D fed by the vertical movement of a triangular block I having an inclined rib engaging the slide. The block is raised by a screw K rotated by a worm M and ratchet-wheel L from the driving-shaft N, the nut J of the screw being controlled by a treadle O. The mounting of the bed on the slide, and the actuation of the hammer by cams P, 4 are imperfectly described in the Specification.

875. **Newton, W. E.**, [Towle, H.]. April 9.



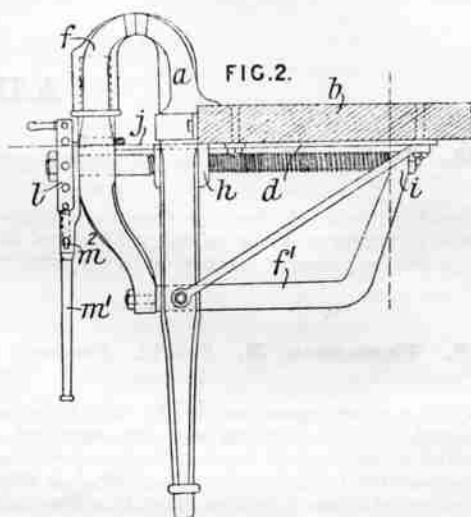
**Bolt extractors.**—A tool for drawing ships' bolts &c. has its jaws *f* in a conical or pyramidal hole in a screw *c*, which is prevented from rotating in the case *a* by a feather while being raised by the nut *d*. The jaws are closed by a spring *i*, and opened by a spring *g* when the ram *h* is raised, the ram being hollow to accommodate long bolts. The nut *d* may be rotated by the handle *k*, or by the gearing shown.

1323. **Roberts, W.** May 25.

**Vices.**—A vice or a carpenter's bench screw has fixed to its movable jaw *f* a bar *j* which slides through the fixed jaw *a* and in a dovetailed slot in a plate *d* on the underside of the bench, and a horizontal rod *f'* which slides through the jaw *a* and carries a bearing *i* and is secured to the bar *j*. The screw is rotated in the jaw *f*, the bearing *i*, and the nut *h* by a lever, or rapidly by means of a wheel *l* and slowly by a lever *m* pivoted on the screw and carrying a bolt *m'* to engage holes in the wheel *l*. The upper part of the movable jaw may be mounted on a vertical pivot.

(For Figure see next column.)

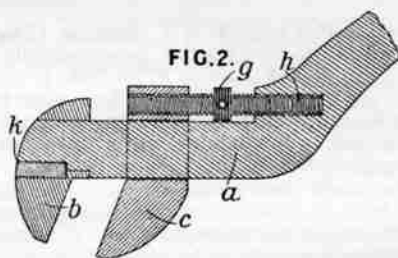
1323.



1509. **Cox, G.** June 12. [Provisional protection only.]

**Cramps.**—A flooring-cramp consists of a bar with lugs or pegs at one end and a pivoted bar at the other. The pegs are placed one at each side of a joist and a wedge is driven between the floor boards and the pivoted bar, causing the pegs to grip the joist and cramping the boards.

1718. **Wilson, T.** July 6.



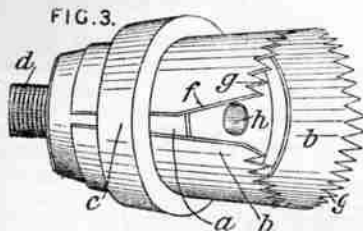
**Spanners and wrenches.**—The movable jaw *c* of a spanner or screw wrench is actuated by a right and left handed screw having a central milled head *g*. The screw may be at the front or back or in a groove in the body, and takes into the body at *h* or the back of the jaw *b* which is fixed in position by a screw *k*. Both jaws may be double-ended.

1753. **Wilkinson, W.** July 11. [Provisional protection only.]

**Files.**—Leather mounted on a stock and sprinkled with emery powder or ground glass, is

used as a file. The leather may be dispensed with, the abrading-material being attached direct to the stock.

1829. Price, W. July 20.



*Augers, hollow; saws.*—A tool for cutting corks, bungs, and other conical bodies consists of a steel band *b*, fixed by a ring *c* on a tapered mandrel *a*. The band has a knife-edge or saw teeth *g* and an inclined knife-edge *f*. The screw *d* is fixed in a lathe or other spindle. The bung &c. is removed by a rod passed through the hole *h*.

1864. Blyth, F. D., [Mears, W.]. July 25.  
[Provisional protection only.]

*Augers, gimlets, and wood-boring bits; handles.*—The screwed part of an auger, gimlet, or brace bit is made to receive interchangeable cutters of different sizes which are kept in position by a lock or catch. The spindle may fit or be fixed by a top screw into its handle.

1965. Rogers, W. R. Aug. 7. [Provisional protection only.]

*Cramps and clamps.*—Relates to apparatus for pressing the dovelled parts of doors &c. together. On the table of the apparatus are mounted two or more parallel sliding beds, each caused to grip the work by a right and left hand screw. To hold the work to the table, each pair of slides carries a crosshead, from which is suspended a screw and pressing-plate actuated by a hand-wheel. Another pair of slides applies pressure at right-angles.

2107. Childs, A. B., [Childs, D. M.]. Aug. 23.

*Diamond and like tools.*—A tool with one, or two or more diamonds or similar stones at equal distances apart, is used for dressing or cracking millstones.

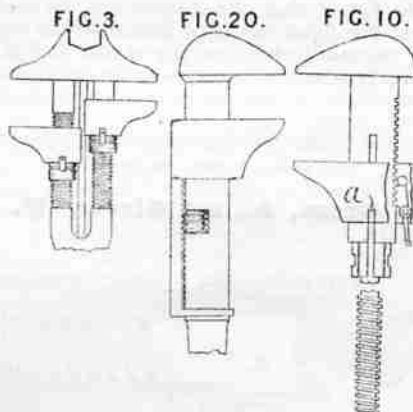
FIG. 3.



2154. Penrose, R., [Peace, J.]. Aug. 30.  
[Provisional protection only.]

*Stocks and dies.*—A screwing-stock is made to act as a guide for the die, which is tapered, so that a full thread may be cut at one operation, and arranged with its cutting-part parallel to and concentric with the side of the guide.

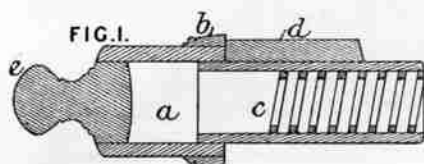
2248. O'Neill, P. B. Sept. 9.



*Spanners and wrenches.*—In one of the various screw-wrenches or spanners described, the movable jaw slides on two bars secured at one end to the fixed jaw and at the other end to a handle; or they may be formed into a handle, the movable jaw being adjusted by nuts on the screwed bars. There may be a movable jaw on each bar, as shown in Fig. 3, the bars being square with threads on their angles, or a third bar may be used to prevent the jaws from rotating. Pins or plates depending from the jaws may engage grooves in the nuts. The two bars may be plain and the movable jaw adjusted by means of a central fixed screw and a nut, or the central fixed bar, instead of being screwed, may be toothed or notched on two of its opposite edges to be engaged by two catches on a sliding tube which may be separate from or connected to the movable jaw. In this case, the two outer bars may be dispensed with, and the jaw may be adjusted by a screw swivelled to the jaw and engaging threads on the edges of the slot in the bar; or the edges of the slot may be plain and the screw replaced by an internally-threaded tube connected to the jaw and working on a square-ended screw. The projecting parts of the tube and screw are enclosed in a tube or handle fixed to the bar. The tube and screw threads may be interrupted to allow the wrench to be quickly adjusted, or the jaw may be secured to a rod passing down the slot in the bar and screwed to engage a thread on the interior of a tube or handle which is free to rotate but cannot move longitudinally. In the wrench shown in Fig. 10, the movable jaw is not rigidly connected with the end *a* of the screwed rod, and can be fixed for light work by a catch and teeth on the back edge of the bar. Instead of slotting the bar, it may be prolonged through the

handle, this prolongation being of a square section or slotted to receive a short square-socketed screw or a cross-piece with segments of screws on its ends. This screw or cross-piece is connected by side rods to the movable jaw, and is operated by an internally-threaded rotatable handle. The upper ends of the side rods may be connected by a cross-piece traversing a small slot in the upper end of the bar. In spanners in which the movable jaw slides on and is fixed by a spring catch engaging teeth or notches on or in one edge of the bar, mechanism is provided for forcing the jaws together. This mechanism is not fixed to the movable jaw, so that the spanner may be readily adjusted for light work and locked by the catch. In the worm-adjusted spanner shown in Fig. 20, the worm is placed in a recess in the bar, instead of in the movable jaw, and a rack is attached to the movable jaw.

**2294. Green, A., and Glover, W. H.**  
Sept. 14.



*Vices.*—A vice-box is made by bending and welding up a plate to form a cylinder *a*, welding on to this a collar *b*, welding one or two ribs *d* on to the barrel *c*, and welding the barrel and a plug *e* into the part *a*, or the parts *a*, *c* may be in one. A screw thread is formed by winding a square or T-sectioned rod upon a screwed mandrel, and is either brazed or welded inside the barrel *c*.

**2310. Brooman, R. A., [Pougnaire, C., and Bourcy, J. S.].** Sept. 16. *Drawings to Specification.*

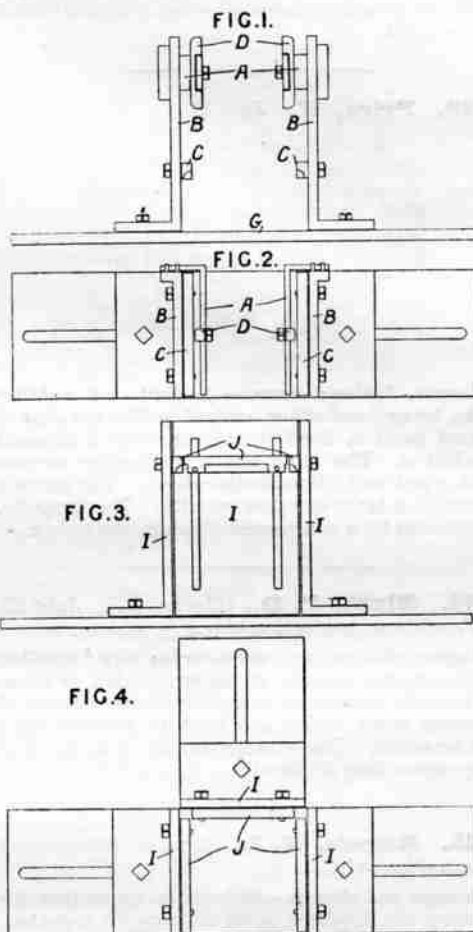
*Combination tools.*—A ratchet spanner for use with wire stretchers &c., is shaped at its lower end to act as a screwdriver or as a hammer.

**2461. Breffit, E.** Oct. 2.

*Cramps and clamps.*—The sides and ends of wood boxes are put together in an apparatus such as that shown in Figs. 1 and 2. The ends are held between guides *A* and uprights *B*, and rest on adjustable bars *C* during the nailing of either side. Adjustable stops *D*, sliding on the bars *A*, are provided. The uprights *B* are adjustable on the base *G*. The tops or bottoms are nailed to the sides and ends in an apparatus such as that shown in Figs. 3 and 4. The body of the box is laid on adjustable bars *J*, carried on the adjustable sides *I*, and then the top or bottom is nailed on.

(For Figure see next column.)

**2461.**



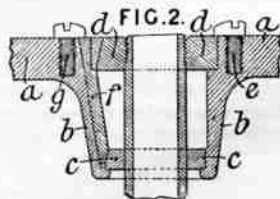
**2482. Ghislin, T. G.** Oct. 4.

*Handles.*—A substitute for wood, bone, &c. for hand-tool handles, is made by treating marine plants of the genera *eiklonia*, *laminaria*, *duvillaea*, *sarcophycus*, &c.

**2524. Russell, J. J.** Oct. 9.

*Stocks and dies.*

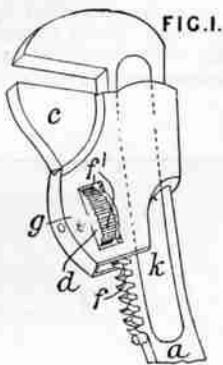
—A screwing-die *d* is circular, solid, and bell-mouthed, and is held in the stock *a* by screws *e*, *g* and a wedge-piece *f*, which also prevents the die from rotating and fixes the guide-ring *c* at the bottom of the stock boss *b*. When the die



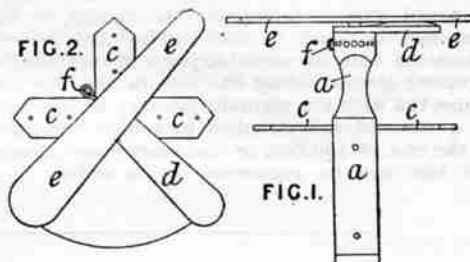
is worn, it is softened, the cutting-parts are hammered nearer together and the die is re-tapped and re-hardened.

**2583. Weston, W. T.** Oct. 17.

*Spanners and wrenches; cramps.*—The movable jaw *c* of a screw wrench is adjusted by means of teeth *f* on the front or back of the bar *a* and an eccentric thread or helical worm on the face of a milled disc *d*, provided with radial holes *f'* for a lever. The bar may have segmental or angular projections *k* on each side, and the part *g* on which the disc *d* is pivoted may be hinged so that the worm and rack may be disengaged; or the jaw *c* may be loose on the arm *a* and the rack and worm kept in engagement by a spring. The mechanism may be applied to cramps, and the handle may be dispensed with and the jaw *c* provided with a groove, pulley, or roller working in a slot on a stud or pin.



attaching to an ordinary bench or table to obviate the necessity of tailors sitting cross-legged. A vertical pillar *a* is attached to the edge of a bench or table by the tongues *c* and the arm *a*. To the top of the pillar is attached a padded



board *d* and a sleeve board *e*, which is pivoted at its centre and secured in position by a pin *f*. Between these two boards is placed a piece of baize, silk, or other material, which is stretched by separating the boards, the apparatus thus forming a substitute for the thigh and knee. When the sleeve board *e* is required for pressing, it may be swung round in front of the operator.

**2868. Heap, W.** Nov. 14. [*Provisional protection only.*]

*Pipe and rod cutters.*—The cutter-holder and a stud carrying the antifriction rollers of a pipe and rod cutter are acted on by the ends of the handles, which pass through screwed bosses.

**2825. O'Reilly, F.** Nov. 9.

*Benches, work.*—Relates to an arrangement for

## A.D. 1862.

**41. O'Neill, P. B.** Jan. 6. [*Provisional protection only.*]

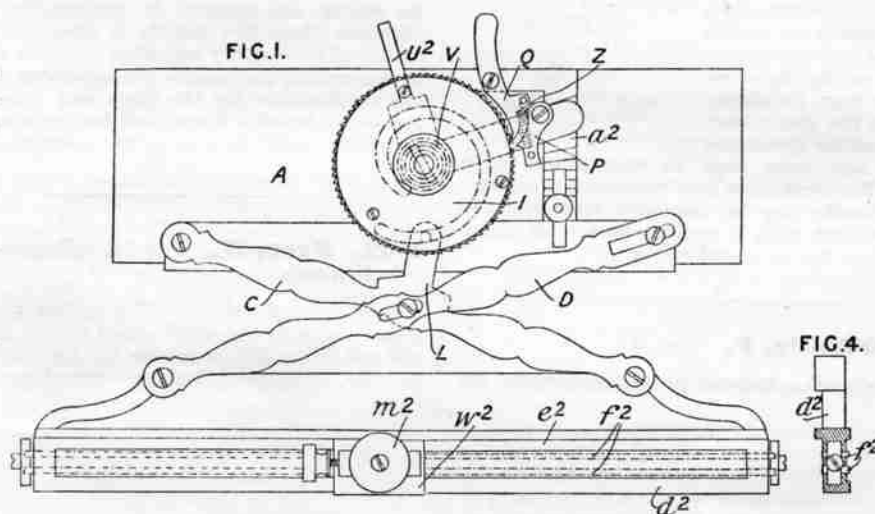
*Spanners and wrenches.*—In one form of screw-wrench or spanner, the movable jaw slides on the two prongs of a forked bar carrying the fixed jaw, and is locked in any position by a spring catch or catches carried by the movable jaw or a slide moving with the jaw and engaging teeth on one or both inner edges of the prongs. There may be a movable jaw on each prong, and the jaws may have recesses to fit various sized nuts. The catches may be replaced by rotatable screws engaging the teeth on the prongs, "semi internally-threaded" nuts, or catches. The teeth may be on a rod between and parallel to the prongs. When there is only one movable jaw, the screw engages the teeth of both prongs or a

nut between the prongs, and the bar may be solid at the place where the movable jaw slides and be slotted lower down, the jaw being connected by side straps to the screws. These straps may be connected by a cross-piece passing through a small slot in the bar. A double-grooved nut connected to the side straps and sliding in such a lower slot may be engaged by a screw provided with a suitable head for turning purposes. There may be a fixed screw between the two prongs and on this screw and below the movable jaw, one or more washers and a nut or nuts, or the screw may be rotatable and work through a tapped hole in the movable jaw. In another form of wrench, straps depending from the movable jaw work on the sides of or in grooves in the main bar, and are screwed and engaged by a rotatable nut on the bar, but the straps may be connected by a web working in

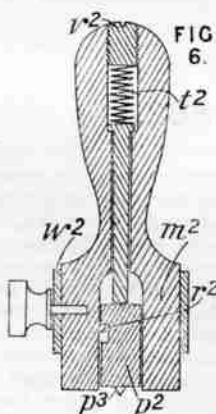
a slot in the bar and the nut replaced by an internally-threaded handle. The straps may be continued as an internally-threaded tube which is engaged by a screw rotatable in a fixed handle. A stem fixed to the movable jaw may pass down a groove in the bar into the handle and be engaged by a nut immediately above the handle, or the stem may be fixed to the handle, and the nut connected with the movable jaw. An internally-threaded sleeve fitting the slot in the bar and connected with the movable jaw may be operated by a screwed rod attached to a head rotatable on the end of the bar, or the sleeve may fit over the bar and be connected by a swivel to a

threaded tube engaging the screwed bottom end of the bar. In another form of spanner, the movable jaw or jaws are on an oval tube and the fixed jaw or jaws on an oval internally-threaded tube or a screwed bar sliding within the first tube and engaged by a screw fixed to, or the internal thread of, a rotatable handle. When the bar is of an oblong section, screw threads may be cut on two of its edges near the bottom and engaged by a nut mounted in a sliding case or on two grooved stems connected to the movable jaw. In most cases the screws and nuts may have interrupted threads.

118. Knight, J. A., [Dickinson, J.]. Jan. 16.



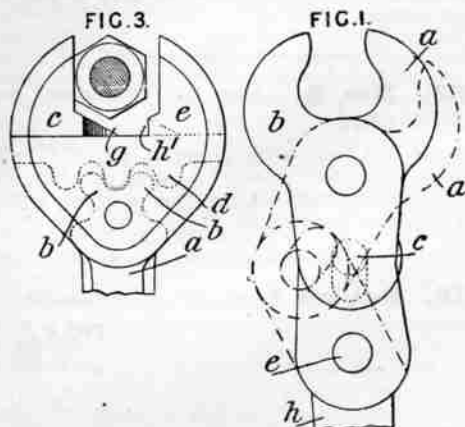
*Diamond and like tools.*—Relates to apparatus for dressing millstones, comprising a parallel-rule guide and a diamond cutting-instrument provided with means for being guided, operated, and steadied. The guide  $d^2$  is connected by crossed links C, D to a bed A on which is pivoted a cam-wheel I engaging with an arm L on the link C. The wheel is turned to adjust the rule by a bell-crank lever  $U^2$  and a pawl P which engages its toothed periphery. The pawl P is connected by a spring Z to a retaining-pawl Q, and



the wheel is provided with a return spring V. The diamond-tool holder is adapted to be moved to and fro in the guide by hand. To protect the setting of the diamond, metal strips  $f^2$  are placed in a channel in the lower face of the guide. The holder  $m^2$ , Fig. 6, has a slot in which a block  $p^2$  carrying a diamond  $p^2$ , is held by a pin  $r^2$ , while the diamond is kept elastically upon the face of the stone by a spring  $t^2$ . In order that the instrument may be drawn with uniform pressure across the face of the stone, an adjustable gauge  $w^2$  is secured to the protector  $m^2$ . A scale  $a^2$  on the frame A is graduated to show the number of lines per inch to be made by the rule. According to the Provisional Specification, to permit the slide to distend after being closed, two toothed quadrants at opposite points of a vertical wheel, are arranged to gear with a quadrant on the short arm of the operating-lever, while to secure uniform spaces between the lines, the notches of the wheel are unequally spaced.



250. Clark, W., [Samuel, P. A., and Verrie, A. T. O. de]. Jan. 30.



*Spanners and wrenches; pliers.*—In a self-adjusting nut or pipe wrench, the handle *h*, Fig. 1, is pivoted at *e* to the fixed jaw *b*, and carries a pin *c* working in a slot in the tail end of the movable jaw *a* which is pivoted at *f*. Or the handle *a*, Fig. 3, is pivoted to the fixed jaw *e* and operates the sliding jaw *c* by means of a rack and teeth *d*, *b*, or by means of two pins engaging a heart-shaped slot in the jaw part *c*. Wedge-shaped projections *g* on one jaw take into holes *h* in the other. In the case of pliers, a second handle may be secured to the fixed jaw.

489. Waller, R. Feb. 24.

*Cramps.*—Relates to boot and shoe machinery of the type described in Specification No. 640, A.D. 1859, [Abridgment Class Boots &c.], a cramp being described which is adapted to hold boot soles while the latter are being dressed. The two ends of a bar are bent at right-angles to the bar so as to face one another. Two bosses on the bent ends are large enough to admit an inner boss each, these each receiving a screw. The screws are provided with check nuts, and holes are made in the inner bosses so that pegs may be put through them and the outer ones and so prevent rotation when the soles are pressed. A modified cramp for holding heels is described in which one leg of the cramp is fixed to and another free to slide on a straight bar.

855. Easterbrook, J., and Allcard, J. H. March 27. [Provisional protection only.]

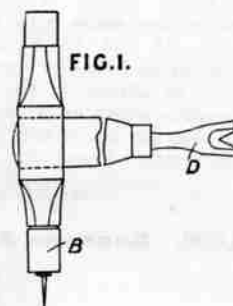
*Vices.*—The movable jaw of a parallel vice has fixed to it a bar which slides on a plate below the screw and box, or through a hole in the fixed jaw. One jaw may be pivoted so that tapered articles may be readily gripped, spherical washers being used on the screw or box.

996. Carter, C. P. April 8. [Provisional protection only.]

*Pliers and cutters.*—For inserting photographs and the like into the mounts of albums, or other flat spaces, an instrument resembling a pair of pliers is used. The jaws are gradually widened out and thinned down to an edge, and the inside of the lower jaw is roughened. The handles may be straight, bent, or bowed, and may be provided with a spring. A cutting edge may be formed on one of the jaws, or on part of the handle close to the pivot, for trimming the cards.

1097. Barbour, J., [Thomson, W.] April 16.

*Hammers; combination tools.*—The head of an upholsterer's or other hammer is magnetized, and coated except at the ends with a non-magnetic substance such as varnish, and surrounded at its picking-up end by a gutta-percha, brass, or other non-magnetic ring *B*. The other end of the head is used for driving the nail home. A nail or tack extracting claw *D* may be fixed to the end of the handle.

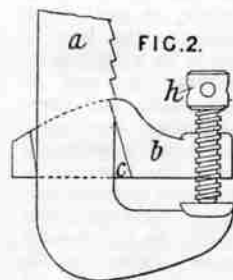


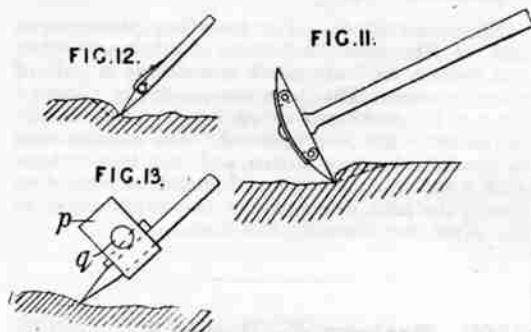
1155. Matthews, S. P. April 21.

*Vices.*—The movable jaw of a vice is fitted with antifriction rollers, and works between and is operated by a screw lever pivoted to two plates which are fixed by a movable pin to allow the jaw opening to be altered. The jaws are separated by a weighted cord passing over pulleys on the plates and the movable jaw.

1246. Wells, H. F. April 29.

*Cramps and clamps.*—In a joiner's or other cramp or clamp, the socket *c* is larger than the bar *a* and is arranged so that the arm *b* grips the plain or serrated bar when the screw *h* is tightened; or the socket may fit the bar and the screw may be mounted in a part which grips the bar, and is hinged to the arm. The arm socket may be in two parts rabbeted and dowelled together, and the dowels may have eccentric heads so that the size of the socket may be reduced. A screw or wedge may be inserted in one end of the socket.



**1309. Ormerod, E., and Schiele, C.** May 3.

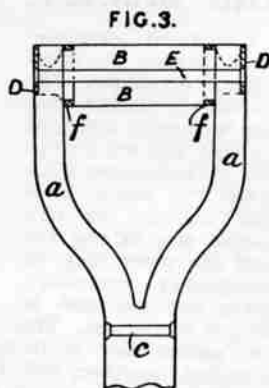
*Picks; chisels.*—Picks and chisels for dressing stone are made with hinged ends, as shown in Figs. 11 and 12, which are returned to their normal positions by springs. A weight *p*, Fig. 13, may be affixed to the front of a chisel, and a handle *q* about or in front of its centre of gravity, so that the line of action of the blow passes behind the centre of gravity.

**1609. Ransome, J. A.** May 28.

*Nailing, hand tools for.*—For driving ing hollow trenails into sleepers, &c., a tool *c*, Fig. 2, is used. It has a concave surface and a projection *d* which holds it in position on the head of the trenail.

**1664. Newton, W. E.,** [Blanchard, A. V., Blanchard, J. D., and Blanchard, F.] June 2.

*Handles.*—The eye of the handle of a spade, shovel, dung fork, or the like is made by splitting or sawing the end of the shaft, and then steaming the split part and bending it into the form of a fork and securing the grip between the ends. In the handle shown in section in Fig. 3, the ends of the grip *B* are recessed to receive projections, on the bent arms *a*, the whole being screwed together by a rod *E* passing through and riveted down upon the metallic caps *D*. The caps *D*



extend round the arms *a* and unite to form a ring *f* which fits the grip *B*. A rivet *c* may be inserted before bending, and the grip *B* may be made hollow.

**1682. Roe, R.** June 4. [Provisional protection only.]

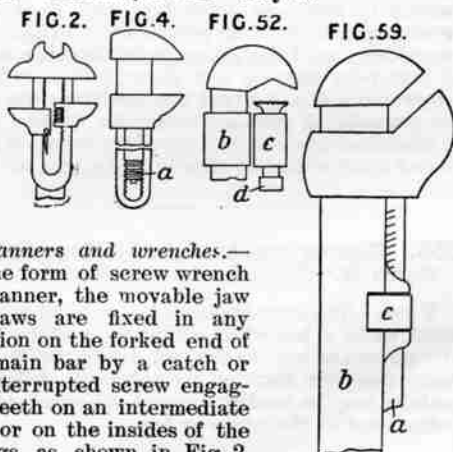
*Planes.*—A tongueing-plane is provided with a fence, with two "planes" working on a bar, and with stops for determining the position, width, and height of the tongue.

**1818. Bedford, J.,** [Schell, J.] June 20.

*Planes.*—To the plane-iron *a* is secured a separate cutting-part *g*, by means of a screw *f* working in a slot in the iron. A break-iron *e* may be adjustably secured behind the cutter *g*, and a guard plate abutting against the rear end of the cutter, fixed to the iron *a*.

**1904. Thompson, N.** June 28. [Provisional protection only.]

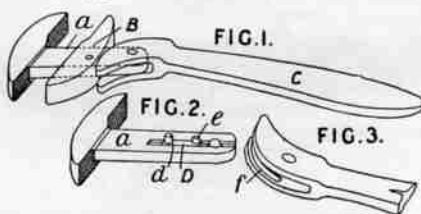
*Screwdrivers.*—A screwdriver, adapted to be used as a stopper key in inserting and withdrawing stoppers, is formed with two pivoted levers which take hold of the upper end of the screw and prevent the screwdriver from slipping out of its notch.

**1954. O'Neill, P. B.** July 5.

*Spanners and wrenches.*—In one form of screw wrench or spanner, the movable jaw or jaws are fixed in any position on the forked end of the main bar by a catch or an interrupted screw engaging teeth on an intermediate rod, or on the insides of the prongs as shown in Fig. 2. The spanner may be double-

ended and its movable jaws operated by a right and left-handed screw in the slot in the bar and a nut capable of being rotated only or of being screwed along the bar. The operating-screw of a single-ended spanner may pass through a handle and be fitted with a knob or fixed to the handle. When the movable jaw traverses at right-angles to the bar, it may be adjusted by an interrupted thumb-screw or by a rack-and-pawl arrangement. The movable jaw of a three-pronged spanner may have swivelled to it a nut working on the central prong, or the nut may be fixed and the central prong rotatable, or straps fixed to the movable jaw and sliding between the prongs may pass down into and be engaged by the screwed interior of the handle or a nut. Side straps fixed to the movable jaw may be connected by a cross piece carrying a nut *a*, Fig. 4, engaging a notched slot in the handle end of the bar, or the straps may be threaded externally and be engaged by a nut rotating in a hole in or on the bar, or may carry set-screws to engage the notched edges of the slot in the bar, or may carry a nut engaging the toothed sides of the bar. When the tool is to be used as a pipe wrench, its jaws may be curved and serrated, one jaw may be pivoted to the sliding socket *b*, Fig. 52, or be adjustable therein by means of an interrupted screw *d* and a threaded socket *c*. The pivoted jaw may be of eccentric form and the socket fixed in any position by a spring pawl. The movable jaw may be secured by straps or directly to a tube working on the bar and within a tubular handle or attached to the handle, or by a key, to an inner tube or a rod, or to a single strap *a*, Fig. 59, which is threaded eccentrically, the screwed part being in a groove in the bar *b* and engaged by a nut *c*. The strap or straps *a* may be extended and notched or threaded to engage the threaded interior of the handle or a nut. Recesses to take nuts of various sizes may be made in the jaws and the handle.

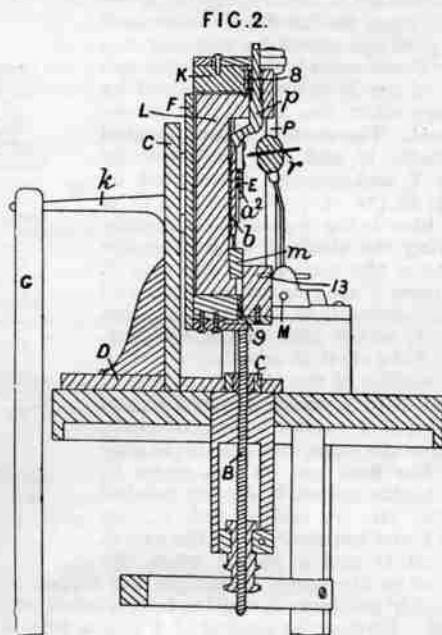
**2196. Thoma, J.** Aug. 5. [Provisional protection only.]



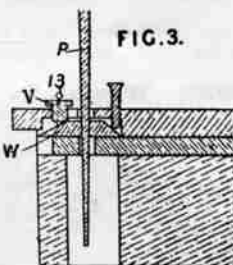
**Spanners.**—The handle *C* is pivoted and has an eccentric end bearing on the movable head *B*. The head *B* is connected by a pin *d* to a piece *D*, Fig. 2, sliding in the slotted stem *a*. A second pin *e* in the piece *D* moves in an eccentric groove *f*, Fig. 2, in the handle. The movement of

the handle in one direction draws back the head, while the movement in the other forces it against the work.

**2492. Bousfield, G. T.,** [Pierce, W. P.] Sept. 10.

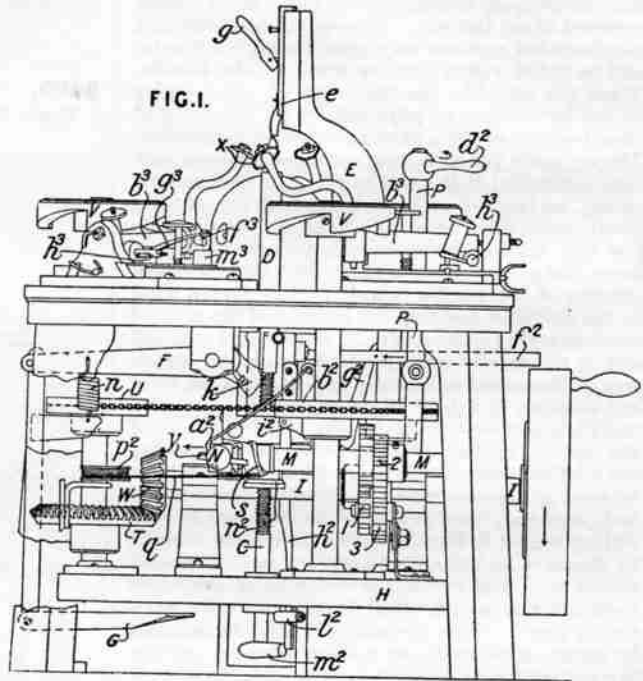


**File cutting machines.**—In a file-cutting machine, the blank *b* is held between a socket *m*, a spring-pressed cap *p*, a plate *E* and a soft-metal faced block *L*, hinged at 8, 9 to a frame *K*, which is slid vertically by the feed-screw *B* in the frame *F* connected by vertical pivots to the standard *C*, and by a bell-crank lever *k* to a weighted rod *G*, which may be lifted to free the blank by a treadle. The platform *D* can be rotated about the centre *c* to bring the face of the blank at right-angles to the direction of motion of the cutter *r*. The blow is delivered by a spring on the shaft *M*, the strength of the blow being varied as the blank changes in width by a tapered bar *P* secured to the frame *K*, a wedge *W* for altering the height of the stop *v*, and a pin 13 on the shaft *M*. A renewable steel block *a*<sup>2</sup> is fixed by a wedge and a screw to the plate *E* where it is liable to be worn away by the cutter *r*.

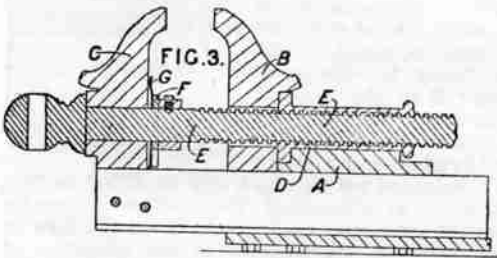


**2494. Bousfield, G. T.,** [Pierce, W. P.] Sept. 10.

*File-cutting machines.*—In a machine for simultaneously cutting all the faces of a file, the blank is held between two pivoted jaws D, the feed screw C and a block e which slides with friction in a dovetailed groove in a standard E, the friction being removed when the handle g is depressed. The jaws are closed by a spring n, a lever F and cams k engaging the tail ends of the jaws, and are opened by springs when the treadle G is depressed. The cutters X are mounted on shafts b<sup>3</sup> and are oscillated by cams V and springs g<sup>3</sup> mounted on shafts h<sup>3</sup>, the strength and length of each blow being regulated by slightly rotating the shafts h<sup>3</sup> or altering the height of the stops m<sup>3</sup> for the pins f<sup>3</sup>. The cams V are rotated by chain and bevel gearing U, T, W from the main-shaft I, which also drives by gearing 1, 2, 3 a shaft M carrying a worm s. One bearing of the shaft M is slid in an arm N by a wedge y, a rod a<sup>2</sup>, and the arm b<sup>2</sup> of a short horizontal shaft, to move the worm into and out of gear with the feed nut on the screw C. This horizontal shaft can be rotated by the arm g<sup>2</sup>, sliding rod f<sup>2</sup>, the shaft P and handle d<sup>2</sup>, or by the arm i<sup>2</sup>, the rod h<sup>2</sup> and a spring when the stop m<sup>2</sup> on the screw C engages the tappet l<sup>2</sup> on the rod h<sup>2</sup> and frees the latter from a catch on the bed H. During the cutting of a file, a cord 9 is wound off the spring drum p<sup>2</sup> on to a spool n<sup>2</sup>



affixed to the feed-nut, and when the stop m<sup>2</sup> throws the feed out of gear, the drum lowers the screw C.

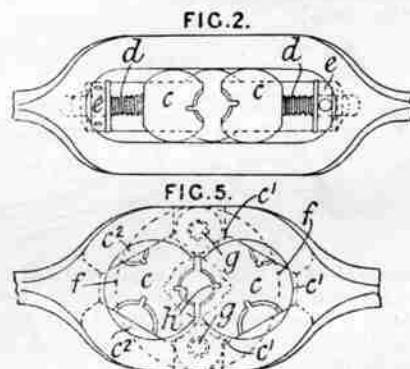
**2620. Wright, P.** Sept. 25.

*Vices.*—The jaw C of a parallel vice is fixed to a bar of a T-section which slides through the fixed jaw B and a box A. The screw E works in the tapped hole in the jaw B or in a screw box D and is fitted with a collar, a washer F, and a spring G between the washer and the jaw C.

**2703. Heap, J.** Oct. 7.

*Stocks and dies.*—One or both screwing-dies c, Fig. 2, are made with tail screws d and fitted with adjusting-nuts e, and the centre of the stock

socket is enlarged to facilitate the insertion and removal of the dies; or the dies c, Fig. 5, have three cutting-faces and flanges c<sup>1</sup>, and are held in



circular holes in the stock by a washer f and screws g, and are prevented from rotating by plates c<sup>1</sup>. The slots h through the die threads are inclined.

**2732. Schofield, W., and Schofield, S.** Oct. 10. [Provisional protection only.]

*Cutters; punching-pliers.*—For cutting button-holes, an instrument is used of the form of a pair of scissors without the cutting-edges. A knife with a tubular end to cut the shank part of the buttonhole is fixed to the upper end of the cutters by set-screws so that it can be adjusted or removed for sharpening. The length of buttonhole to be cut is regulated by providing at the bottom end of the cutters a guide and slot with a graduated scale. A securing-screw is employed in connection with the latter to ensure succeeding button-holes being cut to the same length. Another guide with a stop or projection is fixed to regulate the distance of the hole from the edge of the material.

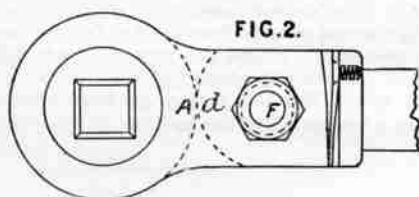
**2941. Andrews, A.** Oct. 31. [Provisional protection only.]

*Files and rasps.*—A tool for cutting or rasping pegs which project through the soles of boots and shoes is in the form of a flat shank having at the underside of one end a rasp and at the upper side a cutting-edge provided with ears or guards to prevent cutting of the lining or upper of the boot. The opposite end is in the form of a hollow cutting-edge, or both ends may be the same, or one end only may be formed into a tool.

**3293. Kiesling, J. A., and Kiesling, C. L.** Dec. 8. [Provisional protection only.]

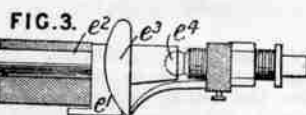
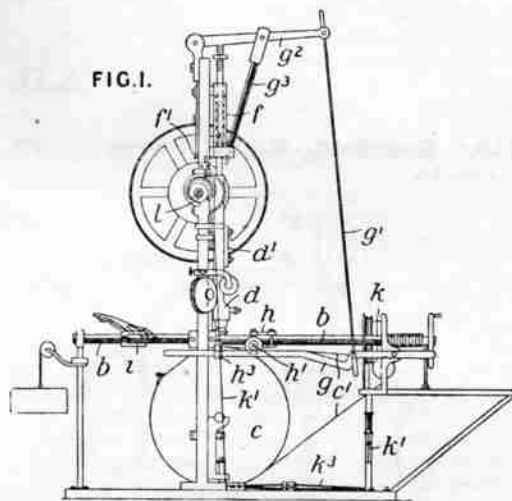
*Files and rasps.*—Worn-out files and rasps are sharpened by being washed with hot water and an alkali to remove grease, dipped in a bath to which nitric acid is gradually added, brushed, and then immersed in a bath of nitric and sulphuric acids.

**3338. Thorold, E.** Dec. 13.



*Spanners* are constructed similarly to the drill brace shown in Fig. 2. The handle is made in two parts pivoted at F, and the end d bears against the body A, formed to fit the nut, so as to grip when pressed in one direction. Springs may be fitted to hold the end d in contact with the body, or the body may be dispensed with and the end d arranged to act directly on the nut.

**3419. Dalhoff, J. B.** Dec. 22.

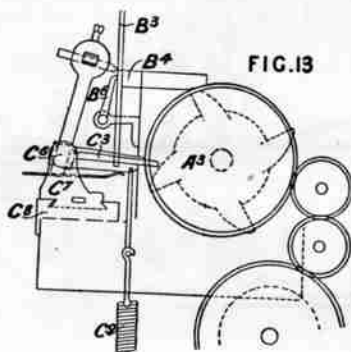


*File-cutting machines.*—A file blank is held by the tongs *i* and a block *h* sliding on bars *b*, and is slid along with a piece of soft iron through a groove in a fixed anvil or over a circular zinc anvil *c* by means of a screw, a ratchet-wheel *k*, and pawls which are operated by rods *k^1*, a lever *k^2*, a spring, and an eccentric on the main shaft *l*. The anvil is rotated by a steel band *c^1*. The hammer *d* has weights *d^1* secured to it by rubber-covered bolts for deadening the blows, is lifted by a cam on the shaft *l*, and is depressed partly by a spring *f* which is more or less compressed to regulate the force of the blow by a lever *g^2*, a rod *g^1*, a cam-bar *g*, and a roller *h^1* on the block *h*. When a file is cut, a cam on the block engages a stop *h^3* and pushes the bar *g* sideways and clear of the roller *h^1*, thus allowing the lever *g^2* to be lifted, and the wedge-ended bar *g^3* to release the catch *f^1* which locks the hammer in its raised position. A chisel-holder may be attached to the hammer, or the holder, as shown in Fig. 3, may be separate and be depressed by a cam on the shaft *l* to grip the file before each blow. The chisel *e^3* is free to move about the spherical pivot *e^4* and in the cylindrical recess in the block *e^1* which can turn about its pivot *e^2* to compensate for irregularities in the blank.



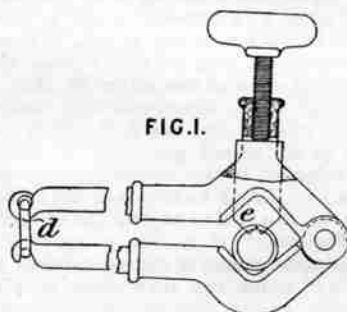
A.D. 1863.

119. Bousfield, G. T., [Pierce, W. P.],  
Jan. 14.



*File and rasp cutting machines.*—In a machine for cutting coarse files or rasps, the blank  $B^3$  is held against the rest  $B^4$  by a spring presser  $B^5$  and is continuously fed upwards, while the chisel  $C^3$  is oscillated by the cams  $A^3$  and a spring  $C^9$  about its pivot  $C^6$  in a carriage  $C^7$ . The carriage is moved in the guide  $C^8$  by a spring and a number of small cams similar to the cams  $A^3$  but of slightly different sizes so that the rasp teeth are not made in vertical rows. The guide  $C^8$  is inclined so that the teeth shall be in horizontal rows across the file.

130. Barraclough, T. C., [Sanborn, G. H.],  
Jan. 15.

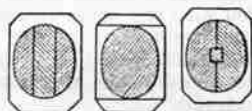


*Pipe and rod cutters.*—The cutter  $e$  of a tool for severing pipes &c. is set up through one of the hinged jaws by a screw. When in use, the ends of the handles are connected by a link  $d$ .

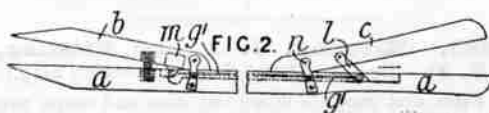
363. Burley, R. Feb. 10.

*Handles.*—Strengthened handles for hammers, mallets, picks, mattocks, &c. are made by glueing together two or more strips of wood as shown in Fig. 4, or strips are glued on to make the big ends as shown in Fig. 5. The joints may be protected with marine glue or by a coating of leather, cane &c., and increased strength may be obtained by imbedding a metal rod, as shown in Fig. 6, which may be threaded at the end and used for securing the head.

FIG. 4. FIG. 5 FIG. 6.



403. Baylis, W., and Hopwood, T. H.  
Feb. 14.



*Forging-tongs.*—The movable jaw  $b$  of forging-tongs and the hinged part  $c$  of the handle are connected so that they close and open simultaneously, by means of a bracket  $m$ , a wire or rod  $g^1$ , and a lever  $l$  pivoted at  $n$  and sliding in the grooved rod  $a$ : or by means of a link, a bell-crank lever, a wire or rod passing through a diagonal slot in the rod  $a$ , and a bracket fixed to the part  $c$ ; or by means of a hinge, the legs of which slide in slots in the nearly-abutting tail ends of the levers  $b, c$ . The jaw  $b$  may be kept closed by sliding a wedge below the tail end of the part  $c$ .

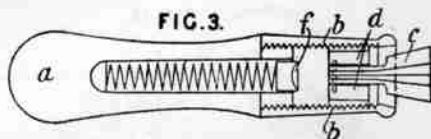
404. Wood, W. Feb. 14. [Provisional protection only.]

*Stocks and dies.*—Die-blocks are made three or four sided with half a die in each face. The triangular blocks are screwed to a back plate, but four-sided blocks slide in the stock, and they or ordinary blocks may be adjusted by a thumb-screw working through a removable nut.

895. Risse, F. J. April 9.

*Handles.*—A haft or holder for a file or chisel &c. has its ferrule  $b$  screwed on to the wooden part  $a$  and a second ferrule  $d$  screwed into the ferrule  $b$ . The tool tang is pushed against the spring socket  $f$  and between the jaws  $c$ , which are

pivoted to the ferrule *d* and are pressed against the interior of the ferrule *b*, the ferrule *d* being



screwed into or out of the handle to suit tangs of various sizes.

**905. Colomb, G.** April 10.

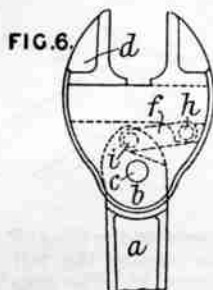
*Handles.*—Blocks for making handles are formed by rolling wood shavings of various colours into bundles, either with or without thin strips of soft metal, horn, whalebone, ivory, tortoiseshell, papier mâché, &c., or into trusses which are packed in a frame, then dipped in glue, marine glue, or rubber solution &c., compressed, and dried.

**987. Heap, J.** April 21. [*Provisional protection only.*]

*Spanners and wrenches.*—The hollow handle of a nut, pipe, or pin wrench is capable of being screwed up and down the stem of the fixed jaw to vary the leverage, and has a flange to regulate the sliding of the movable jaw on the rectangular part of the stem. The jaw carries a pivoted spring-pressed nib or tongue and its adjusting-screw, instead of being hollow and working on a pin, is made in one with its pivots which rotate in plates let into the wrench head.

**994. Newton, W. E.,** [*Schwartzkopff, L.*] April 21.

*Spanners and wrenches; combination tools.*—The single or double-ended movable jaw *d* of a nut or pipe wrench is moved up and down or along the forked stem of the fixed jaw part *b* by links *f* pivoted to the jaw *d* and to the handle *a*, which is fulcrumed at *c* in the fork of the jaw part *b*. During the closing of the jaws, the links *f* abut against the ends of recesses in the parts *a*, *d* so that no excessive strain comes on the pins *h*, *i*. In a double-sided wrench, one pair of jaws may be small and be used as pincers or for extracting nails.



**1010. Newton, W. E.,** [*Clavel, C. A.*] April 23.

*Files and rasps.*—Files to be sharpened are cleaned with soap suds and sand or pumice stone and then immersed in a preferably hot mixture of nitric and sulphuric acids, any parts of the files to be protected, or the edges of the teeth when the cuts are to be deepened, being covered with varnish, sealing-wax, or shellac. The files are afterwards dipped in lime water, brushed with powdered coke, and oiled.

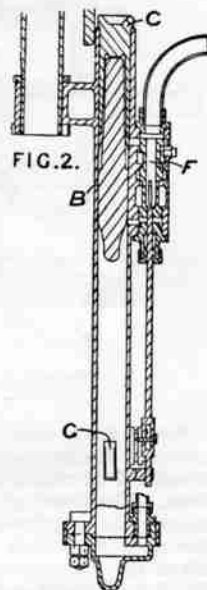
**1041. Stroud, J. T.** April 25. [*Provisional protection refused.*]

*Taps and dies.*—Consists of a "duplex tool" by which it is possible "at one operation to make a screw both inside and outside of a piece of work."

**1095. Gray, J. M.** May 1.

*Percussive hand tools.*—

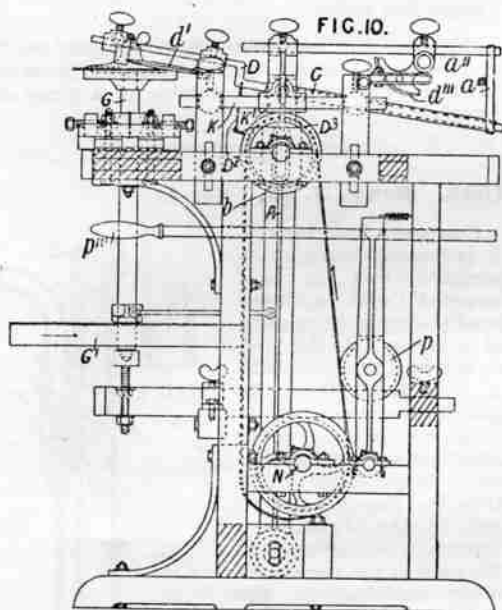
A percussive machine or portable tool is constructed with a tool-head *C* sliding in one end of a steam cylinder and struck by a loose piston *B*. A slide valve *F* of the piston type admits steam to the ends of the cylinder alternately, the valve being moved in one direction by steam pressure and in the other by a tappet *G* projecting into the path of the piston. In other modifications, the valve may be operated in both directions by tappets or by auxiliary pistons. The arrangement of ports in the cylinder is varied to suit the valve gear used. The admission of steam to return the piston may be varied to vary the speed of the hammer, the force of the blow remaining constant. The stop valve is a slide valve closed by a spring and opened by a cord with a finger ring or by a push-rod. The tool head may be provided with a spring to return it after each blow and to serve as a buffer when it is struck while not in contact with any work, this device being illustrated in the Specification in connection with a portable tool for shipping, caulking, &c. In a machine for planishing pipes &c. the tool head may be secured to a diaphragm on the end of the cylinder. Machines or apparatus such as described may be applied to the thinning of the edges of copper plates and the riveting of bulkheads and bridges, and to gold-beating, forging, quarrying, mining, tunnelling, stone-dressing, ore-stamping, &c.



**1155. Droop, J. C.** May 8. [Provisional protection only.]

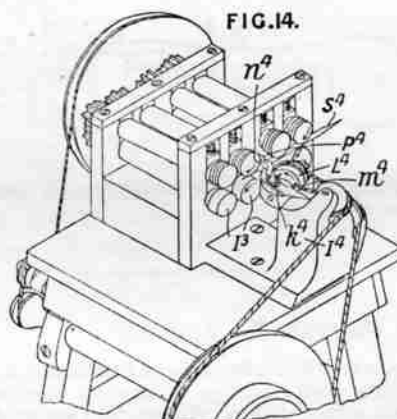
*Holding and picking-up tools, hand; nailing, hand tools for; combination tools.*—A magnetized tool for picking-up and holding nails, tacks, and screws while being driven home is partly covered with india-rubber, gutta-percha, or other non-magnetic substance and may have a claw for extracting nails &c.

**1194. Emery, H. L.,** [Emery, G. W.]. May 12.

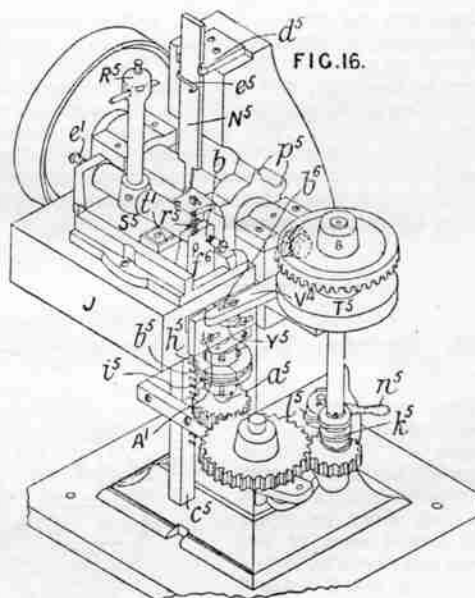


*Saws, sharpening.*—A machine for filing the teeth of ginning and other saws has a vertical spindle G on which the blank is clamped between discs. The bearings of the spindle are adjustable to suit the required inclination and position of the spindle, which has a ratchet-wheel G¹ to effect the requisite spacing of the blank. The file d¹ is clamped upon a cranked stem D held in a tube C pivoted between the trunnions of a vibrating arm A, which are carried by a slide K¹ moving on guides K. The arm is vibrated by a crank pin on a disc b driven by a band from the driving-shaft N. The band is kept taut by a jockey pulley p operated by a handle p¹¹ and is released after each complete revolution of the blank, thus stopping the file. An arm a¹¹ on the vibrating arm is connected by a spring a¹¹¹ with the tube C to keep the file upon the work, the file being intermittently lifted by a cam d¹¹¹ on the arm a¹¹ engaging the tube C and having a pin working in a slotted arm attached to the framing. The rolling motion of the file is obtained by an arm D² on the file stem engaging a rod D² secured to the frame. The machine is duplex, only one half being shown.

**1218. Bousfield, G. T.,** [Pierce, W. P.]. May 14.



*File and rasp cutting machines.*—A machine for cutting the edges of triangular and half-round files is shown in Fig. 14, and a rasp-cutting machine in Fig. 16. The blank S⁴, Fig. 14, is passed between grooved feed-rolls I³, and is operated on by a disc cutter P⁴ carried by a lever n⁴ pivoted to a heavy arm k⁴ hinged on the standard I¹. The arm k⁴ carries a stop which



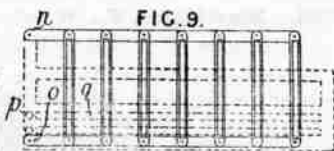
rests on the file and also a pulley L⁴ with pins m⁴ to engage the tail end of the spring-pressed lever n⁴. The rasp N⁵, Fig. 16, is held by a bent wire e⁵ against the rest d⁵ and is intermittently fed upwards by pins b⁵ on the bar c⁵ and the inclines i⁵ of the quadrants h⁵ which are adjustable relatively to each other up and down the shaft a⁵. To throw the feed-mechanism out of gear, the clutch collar k⁵ is raised by the

thread  $l^5$  and the handle  $n^5$ . The cutter head  $R^5$  is oscillated on the pivots  $e^1$  passed through holes  $b$  or  $f^5$  by the cams  $p^5$  and a spring  $r^5$ , the cutter being slightly withdrawn after each stroke by a spring  $t^1$ . The carriage  $S^5$  is reciprocated by a sliding bar  $Y^5$ , a lever  $V^4$ , and a cam groove in the disc  $T^5$ , the magnitude of the reciprocation being determined by the position of the guide block  $A^1$  for the bar  $Y^5$  on the table  $J$  and consequently the position of the pin in the slot  $b^6$ .

**2014. Lishman, M. H.** Aug. 14.

*Tools for setting-out work.*—

A modification of a spacing-apparatus, used with a punching machine, is used for marking-off holes to be punched. A frame, shown in dotted lines in Fig. 9, has a number of holes  $p$ , of the diameter of the holes to be punched, in line with slots  $q$  of equal width. An upper frame pivoted at  $o, n$  carries cross-bars also slotted to the hole-diameter. A hole  $p$  and an intersection of a cross-bar slot and slot  $q$  are placed over the end marks, and other marks are made through the intermediate intersections.



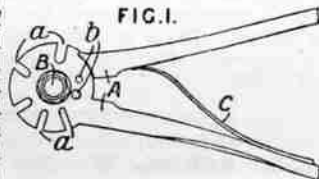
**2086. Brooman, R. A.,** [Micolon, H.], Aug. 22.

*Hammers; handles.*—Hammers and other tools are cast from a mixture of iron and steel melted with manganese and borax or other flux in a cupola or reverberatory furnace. The alloy may be cast round a hollow metal core into which the handle is fitted.

**2323. Alcan, G.,** [administrator of Alcan, E.], [Gauchez, L.], Sept. 21.

*Combination tools.*—The two

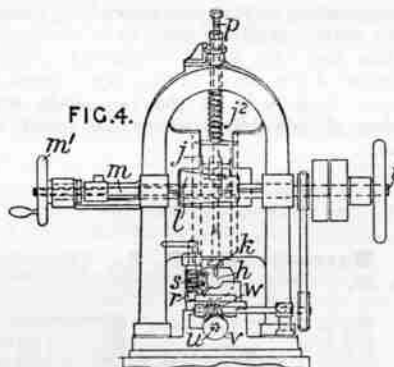
similar parts  $A$  of shears for metal threads, rods, and wires are pivoted at  $B$  and provided with notches  $a$  for cutting and gauging, and with holes  $b$  for gauging wires. A spring  $C$  normally holds the parts  $A$  so that their notches are coincident.



**2340. Cleminson, W.** Sept. 23. [Provisional protection only.]

*Wrenches.*—The upper jaw and the screw-threaded handle of a pipe wrench are in one, and the sliding jaw has a projection engaging an annular recess in the adjusting-nut, and a sliding wedge which binds or releases the work when the tool is turned in one or the other direction.

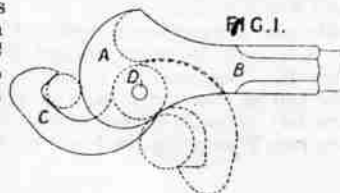
**2385. Preston, F.** Sept. 20.



*File and rasp cutting machines.*—The ram  $j$  of a file or rasp cutting machine is held against two sides of its  $V$ -slides by a spring so that it may yield in one direction, and is reciprocated by a spring  $j^2$  and a cam  $l$  which is partly conical and partly cylindrical and is moved along the shaft  $i$  by the screw  $m$  and a hand-wheel  $m^1$  to vary the force of the blow. The cam may act on a lever connected with the ram, and the fulcrum of the lever may be moved to vary the force of the blow. The work-table  $h$  can be tilted by the worm and sector  $s, r$  and intermittently advanced by a screw  $u$ , a worm-wheel  $v$ , and a continuously-driven irregularly-threaded worm  $w$ . To compensate for the wearing away of the chisel  $k$ , a screw bar  $p$  passes through the ram  $j$  and abuts against the chisel shank, or washers may be placed between the shank and the bar or between the bottom of the ram and the chisel-head.

**2524. Bewley, R.** Oct. 15.

*Wrenches.*—A wrench for pipes &c. has an angular jaw  $C$  pivoted at  $D$  to the handle  $B$  and a fixed cam or spiral-shaped jaw  $A$ . The jaw  $C$  may be serrated.

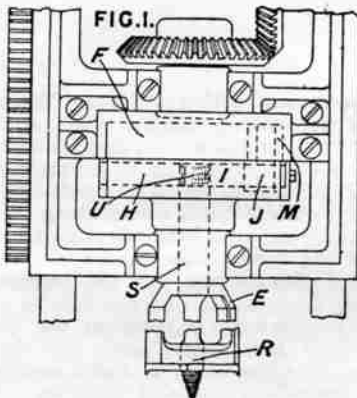


## A.D. 1864.

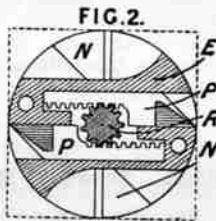
- 347. Newton, A. V.,** [Howell, J., and Birdsall, D.]. Feb. 9. [Provisional protection only.]

*Taps.*—Relates to the tapping of threads in the tube plates of steam boilers, condensers, and other apparatus, so that corresponding threads in the two plates shall be true to a common axis. The tap has two heads which are adjustable lengthwise of the shaft of the tap. Provision is made, at both ends of the tap shaft, for the reception of wrenches, which are used simultaneously.

- 487. Barraclough, T. C.,** [Merritt, B.]. Feb. 27.



*Augers and wood-boring bits.*—The bit E of a hand-operated machine for boring square and angular holes in wood has two fixed cutters N and two cutters P which are reciprocated by pinions R, U, a spindle S, and a rack I sliding in a radial slot in a box H on the bit shaft and fitted with an adjustable pin J carrying a square block M working in a square or other shaped groove in a fixed cam F. Two grooves at right-angles are cut in the top of the block M, and square projections are left at each corner of the square groove in the cam F to guide the block past the corners.



- 565. Jordan, C.** March 7. [Letters Patent void for want of Final Specification.]

*Files.*—Files, before or after being hardened, have their teeth sharpened by the action of nitric or hydrochloric acids, aqua regia, &c.

- 636. Rawlings, T.,** [Webster, W.]. March 12. [Provisional protection only.]

*Combination tools.*—The face of one jaw of a wrench is recessed and provided with pins for receiving and steadying a roughened clasp or a toothed, pointed, or knife-edged cutter, thus converting the tool into a pipe wrench or a pipe and rod cutter. The clamp and cutter are wedge-shaped to prevent the article held from slipping out of the jaws.

- 1070. Newton, A. V.,** [Stephens, A.]. April 28. [Provisional protection only.]

*Vices.*—The stock of the vice is a box, the upper part of which forms the fixed jaw. To the movable jaw, the shank of which has a handle on either side, is attached a ratchet bar sliding in slots in the box. The ratchet bar is fixed in position by a pivoted ratchet piece and a toggle-joint, operated by a lever with a cam-like projection. The toggle-joint applies the pressure to the ratchet piece through the medium of a short bar with rounded ends.

- 1164. Upward, A.** May 7. [Provisional protection only.]

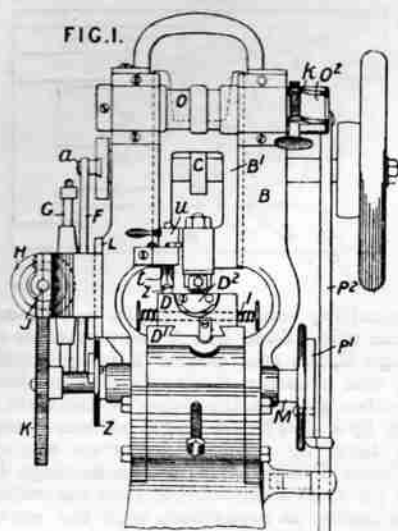
*Combination tools.*—In an apparatus for boring and tapping gas and water mains and in fitting service pipes thereto, a disc or cover of flexible material having an opening for a junction tube is applied to the cylinder containing the drill and tap, to prevent leakage when the main is tapped or drilled. Discs of this kind are applicable to the apparatus described in Specification No. 1094, A.D. 1860.

- 1256. Adkins, W.** May 18. [Provisional protection refused.]

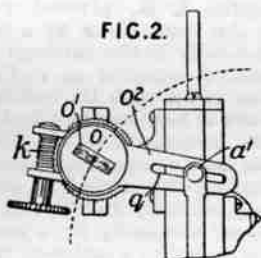
*Spanners and wrenches.*—The handle of a wrench is pivoted to the shank and has a cam end which engages the movable jaw.



1290. **Bousfield, G. T.**, [Nicholson, W. T.]. May 23.



**File-cutting machines.**—The bed  $D^1$  of a file-cutting machine is adjusted in inclination by a spring-centered worm  $I$  in a carriage  $D$ , which is moved by bands secured to the carriage and to a drum on the shaft  $M$  in the bed  $D^1$ , which can be adjusted in inclination about the shaft  $M$  as centre. The shaft  $M$  is rotated by an adjustable crank-pin  $a$ , reciprocating rods  $F, G$ , bands secured to rods  $G$  and a loose wheel  $H$  on the worm shaft  $J$ , a ratchet-wheel on the worm shaft, and a worm and worm-wheel  $K$ , the worm carriage being free to slide up and down the guides  $L$ , and the worm-wheel capable of being mounted eccentrically to feed the file at a variable rate. The cutter is raised by a cam  $C$  and depressed by the weight of the carriage  $B^1$  and a flat spring or springs  $O^1$  in a divided shaft  $O$ , one part of which is connected to a pitman  $P^2$ , the force of the blow being varied according to the width of the blank by an angularly-adjustable cam  $P^1$  on the shaft  $M$ . The range in the force of blow is varied by moving the pin  $a^1$  in the slot  $q$ , and the intensity of the blows by moving the arm  $o^2$  relatively to one part of the shaft  $O$  by a worm  $k$ . A cam  $Z$  and an incline  $z$  are arranged to lift the worm clear of the wheel  $K$  and a rod  $t$  until an indicator  $u$  can be rotated on a cylindrical part of it by a spring, when the blank has been cut to any particular point. The indicator  $u$  also holds the carriage  $B^1$  suspended.



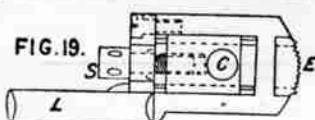
1295. **Ross, P.** May 25. [Provisional protection only.]

**Handles.**—The tang end of a stock or handle for a tool &c. is split with two saw cuts preferably at right-angles, and has a screwed and conical outer surface fitted with a conical nut. The tool tang enlarges towards its end, and is gripped when the nut is screwed on to the elastic conical end of the handle.

1466. **Agnew, T.** June 14. [Provisional protection only.]

**Cramps.**—A picture frame clamp has two clips which are moved at right-angles to each other by screws.

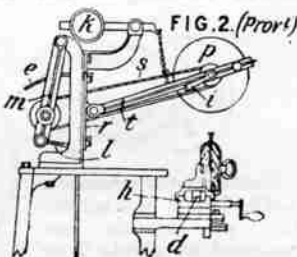
1645. **Wyley, A., and Grainger, J.** July 1.



**Files and rasps; scrapers, metal-working.**—Fig. 19 shows a tool for finishing the circular bottom of a slot cut in the barrel lumps of the small-arms described in the Specification. The cutter  $E$  is fed forward by a screw  $S$ ; a reciprocating motion about a centre  $C$  is imparted by the handle  $L$ .

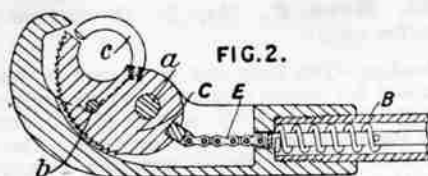
1724. **Robinson, J.** July 12.

**Saws, sharpening; vices.**—An emery wheel  $p$  for sharpening saws is mounted in a frame  $t$ , provided with handles  $i$  and pivoted to an angularly-adjustable ring  $r$  carrying pointers moving over scales. The tension of the driving-guts  $s$  is adjusted by the hinged lever  $m$  and the screw  $l$ , and the frame  $t$  is balanced by a weight  $k$ . A straight saw is held in the vice  $e$  which is moved by rack and pinion gear over an angularly-adjustable block  $h$ . The vice  $e$  may be replaced by one with an adjustable pivot for a circular saw. Different wheels  $p$  are used for gulleting and for grinding the tops of the teeth.



1747. **Pitcher, G. W.**, [Read, H.]. July 13.

**Wrenches.**—The toothed jaw  $C$  of a pipe wrench is mounted eccentrically on a pin  $a$  and is provided



with a handle *c* and a stop *b*. The handle is pulled towards its closed position by a chain *E* and a rod and spring within the handle *B*.

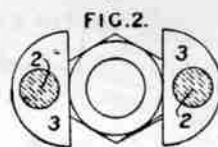
**2042. Hodgson, G.** Aug. 17. [Provisional protection only.]

*Vices.*—A drill stand, which may be used as a vice, has one fixed and one screw-operated jaw, by which it can be secured in position.

**2054. Swift, F.** Aug. 18. [Provisional protection only.]

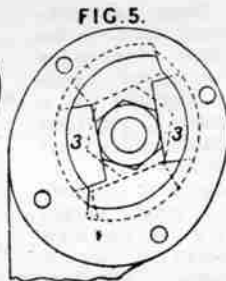
*Spanners.*—A locking-plate secured to the cap plate of a railway or road vehicle axle-box, and partly embracing the nuts, serves as a key for removing them.

**2077. Black, R. M.** Aug. 23.



*Spanners and wrenches.*

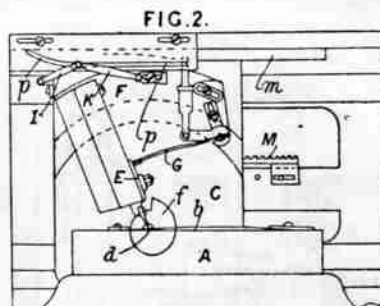
—The jaws 3 of a screw-key or wrench are mounted on pivots 2 or arranged to move on circular slides so as to approach each other and grip the work when the handle is turned in one direction. The handle may be bent out of the plane of the jaws or be cranked like a brace.



**2198. Grafton, H.** Sept. 9. [Provisional protection only.]

*Spokeshaves and like tools.*—One or more cutters for splitting laths and mouldings are adjustably mounted in a hand-frame.

**2221. Potter, E. O.** Sept. 10.



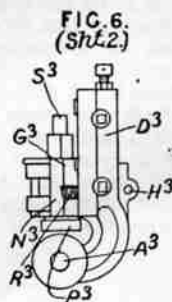
*File-cutting machines.*—In a file-cutting machine with a fixed bed *A* and a movable cutter carriage *C*, the tool carrier *E* is operated by a cam *f* and a spring *G* alone or in combination with other springs, the force of the blow being varied by a cam bar *m* and a pitman connected to a lever or acting directly on the spring. The frame *F* is moved on the carriage *C* and about the shaft *d* as centre, to alter the inclination of the cutter in accordance with the curvature of the face of the blank *b*, by a cam-bar *p* and toggles *I*, *K*, pivoted to the carriage *C* and to the frame *F*, or by a cam *p*, a block sliding vertically in the carriage *C*, and a pin on the frame *F* engaging an inclined slot in the block. The bed *A* with its rocking block on which the blank is held may be tilted instead of the frame *F*. The carriage *C* is advanced by an eccentric on the shaft *d*, a pawl and ratchet-wheel, and a worm gearing with a rack *M*, and this rack is moved longitudinally to vary the traverse by a wedge moved vertically by a cam bar on the carriage and engaging a wedge on the rack.

**2283. Richards, R.** Sept. 17. *Drawings to Specification.*

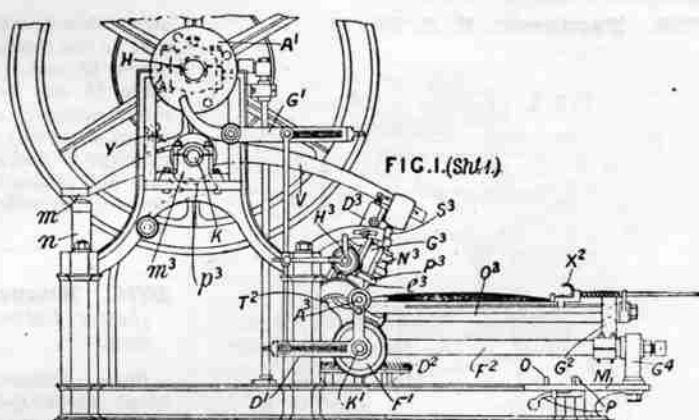
*Spanners and wrenches for axle-caps and nuts* consist of a cranked arm carrying a plain circular eye embracing the part to be turned, and provided with a pin for engaging in a hole in a collar on the cap.

**2355. Fontaine-Moreau, P. A., Comte de,** [Chacot, P. A.]. Sept. 26.

*File-cutting machines.*—In a file-cutting machine the hammer lever *V* is oscillated on its pivot *K* by an eccentric on the shaft *H*, an adjustable bracket *Y*, and a wood buffer *n* in contact with india-rubber springs. The blank is held between a *V*-block and a spring stop *X*<sup>2</sup> in the carrier *o*<sup>2</sup> which can rock in the piece *G*<sup>2</sup> and in a semi-circular groove in the head of an anvil, and is traversed



along the guide rods  $F^2$  by a divided nut, a screw, a bevel-wheel on the screw, a wheel  $D^2$ , a bevel and a ratchet wheel  $F^1$  on a shaft  $K^1$ , levers  $D^1$ ,  $G^1$  with variable effective arms, and an eccentric or a pin wheel  $A^1$ . The frame  $F^2$ ,  $G^4$ , and the anvil are movable about the centre of the wheel  $D^2$  and along the slotted quadrant  $M$  fitted at each end with a stop  $o$  and a catch  $P$ . A bed with covered slides and covering the feed screw may be used instead of the rods and the piece  $F^2$ ,  $G^2$ . The blank is pressed down on the anvil by a roller in a frame pivoted in brackets  $T^2$ , and the guide for the tool holder  $G^3$  is pivoted at  $A^3$  at the same height as the surface of the file carrier  $o^2$ . The holder  $G^3$  is adjusted up and down the guide  $D^3$  by screws, worm-wheels, and worms on a shaft  $H^3$  which is operated by a cam or eccentric on the main shaft  $H$  to withdraw the chisel from each cut and lower it ready for the

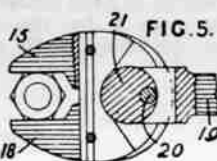


next, and the tool socket  $P^3$  slides in and is lifted by a spring  $R^3$  in a groove partly in each half  $N^3$ ,  $G^3$  of the holder, and is fitted with a renewable pin  $S^3$  to receive the blows and recessed at its lower end to take the cutter  $e^3$ . A hand operated brake or brakes  $P^0$  engage discs  $m^0$  on the shaft  $K$ .

### 2395. Alley, S. Sept. 29.

*Spanners and wrenches.*

—One jaw 18 of a screw-key is moved by an eccentric 21 on the handle 19, which is pivoted at 20 to the other jaw 15. When the eccentric is small, it is preferably fitted with a block working in a slot in the jaw 18. According to the Provisional Specification, the boss 21 may be elliptical or otherwise shaped, and it may act on the inner ends of two jaws sliding in V-grooves.



riveted to either or both arms  $b^1$ ,  $b^2$ . The rear edge of the blade is notched to fit round the circular part of the socket, in which the handle is fixed by a wedge, or a cross-pin, or by bending the point  $B^2$  into the handle.

### 2580. Gilbert, W., and Gilbert, F. W. Oct. 18.

*Handles.*—The ends of spring-knife handles are made of bone, wood, horn, stag, ivory, tortoise-shell, mother-of-pearl, and ebony, instead of metal.

### 2439. Davies, E. Oct. 4. [Provisional protection only.]

*Stocks and dies.*—Blocks carrying screwing-dies are closed and opened by right and left handed screws mounted in projections parallel to the blocks and by spur gearing, the motion of the blocks being limited and the size of the bolt or screw being threaded thus determined by nuts on a screw mounted in the projections.

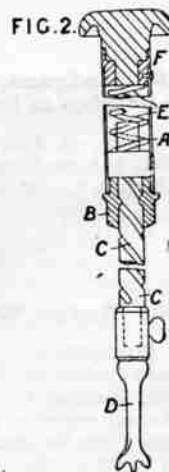
### 2449. Communay, J. O., [Garaboux, A., partly]. Oct. 5.



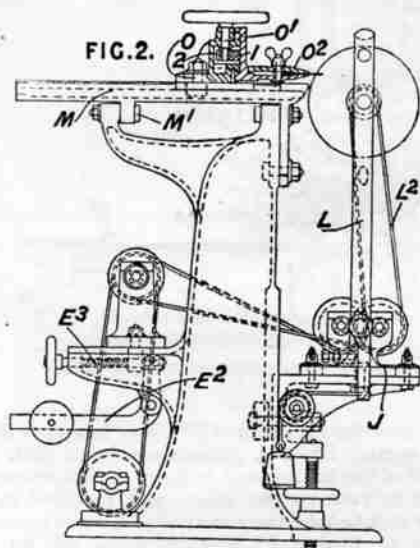
*Handles.*—The blade of a spade or shovel is inserted in a groove  $b$  in the handle socket and

### 2731. Gilbert, F. S. Nov. 4.

*Screwdrivers; combination tools.*—A drilling or boring tool or a screwdriver  $D$  is rotated when the handle  $A$  is pushed over the screwed shaft  $C$ , the handle being returned by a spring  $E$ , and the nut  $B$  or the handle without the knob  $F$  allowed to rotate during such motion by a pawl and ratchet arrangement.



2793. Parnacott, E. J. W. Nov. 10.



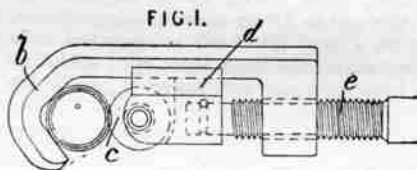
*Saws, sharpening.*—In a saw-sharpening machine of the kind described in Specification No. 1032, A.D. 1858, the emery wheel is preferably constructed in the manner described in Specification No. 1062, A.D. 1864, [Abridgment Class Grinding or abrading], and is mounted in a frame L which is provided with handles and pivoted to an angularly-adjustable turntable J on a vertically-

adjustable bracket. The wheel is driven by a belt L<sup>2</sup> the tension of which is maintained by a screw E<sup>3</sup> and a weighted lever E<sup>2</sup>. The work table M may be inclined on its pivots M<sup>1</sup> and either carries a vertical pivot for a circular saw or an angularly-adjustable slide O on which a carriage O<sup>1</sup> and a saw holder O<sup>2</sup> are moved by a rack and pinion 1, 2. The frame L is drawn from the work by weights and limited in its motion by stops.

3072. Rooper, G., [Standly, R. W.]. Dec. 12. [Letters Patent void for want of Final Specification.]

*Saws.*—Cross-cut and other saws are made with blunt clearing-teeth and spaces for the dust between the cutting teeth.

3213. Wolstenholme, J. Dec. 26.



*Pipe and rod cutters.*—The block d carrying the rotating or fixed cutter c is advanced along the jaw part b by the screw e which serves as the operating handle of the tool.

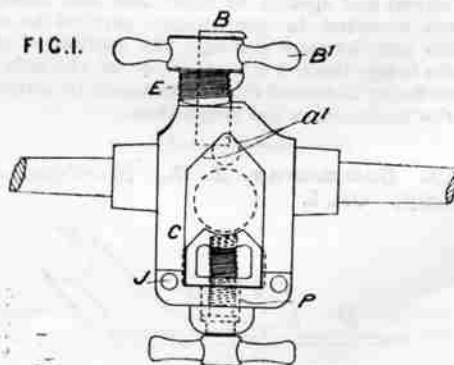
A.D. 1865.

18. Hodgson, G., and Pitt, J. Jan. 3. Drawings to Specification.

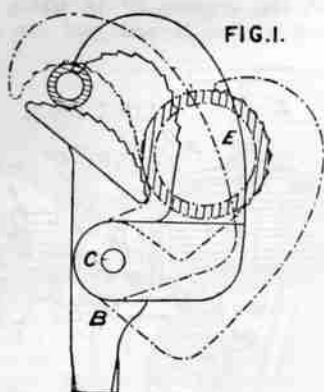
*Vices.*—A drill stand, which may be used as a vice, has one fixed and one screw-operated jaw, by which it can be secured in position.

85. Gedge, W. E., [Chartiez, J.]. Jan. 11.

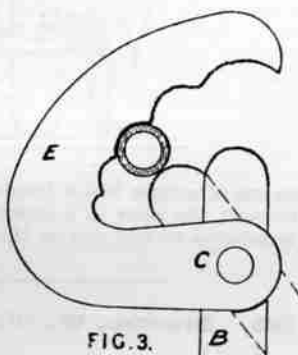
*Pipe cutters.*—A gas or other pipe to be cut is kept against the inclined faces a<sup>1</sup> by the adjustable bearing C, and the cutter B is advanced through a slot in the screw E by a nut B<sup>1</sup>. The pins J can be withdrawn and the piece P removed to facilitate the introduction of large-ended pipes.



86. Gedge, W. E., [Chartier, J.]. Jan. 11.

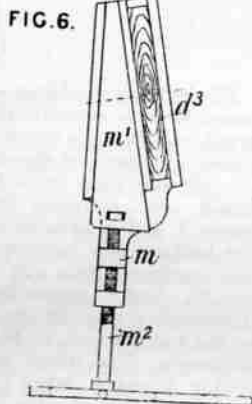


**Wrenches.**—One jaw E, Fig. 3, of a pipe wrench is pivoted at C to the handle B, is wider at its inner than at its outer edge, and is so proportioned that a gas or other pipe may be gripped between one of its notched recesses and the round and notched end of the handle when the axis of the latter nearly passes through the centre of the pipe. A wrench with a jaw E having only one recess and a cammed handle is shown in Fig. 1.



90. Tempest, R. Jan. 11.

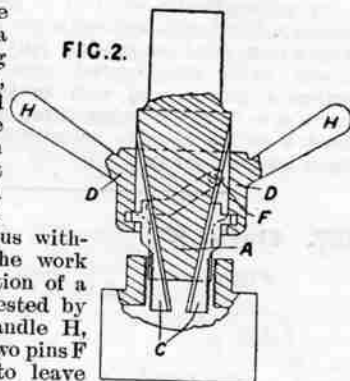
**Vices for holding the lags of tearing cylinders, used in machines for opening fibrous substances, while the teeth are being inserted.** An angle piece or loose jaw  $m^1$  slides, through a screw  $m^2$ , on a cast-iron frame  $m$  and the lag  $d^3$  is securely held between the side of the frame and the jaw while the pins or spikes are driven in.



257. Foster, W. Jan. 28.

**Taps.**—The cutters C of a tool for tapping fittings for gas, steam, and water pipes are pushed down the undercut and inclined grooves in the body A and thus withdrawn from the work when the rotation of a collar D is arrested by means of a handle H, which causes two pins F in the body to leave the horizontal parts and ascend the inclined parts of two slots in the collar.

FIG. 2.



412. Newbery, W. B., [Crane, M. G.]. Feb. 14.

FIG. 2.

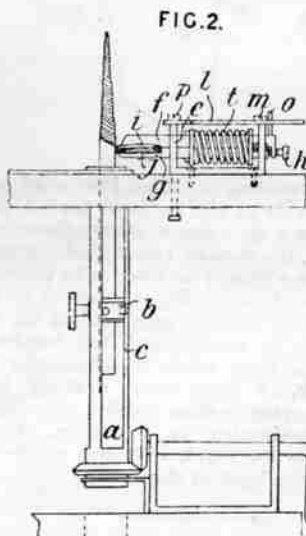
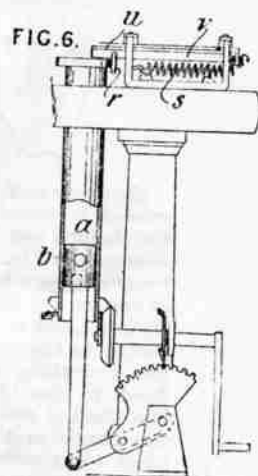


FIG. 6.

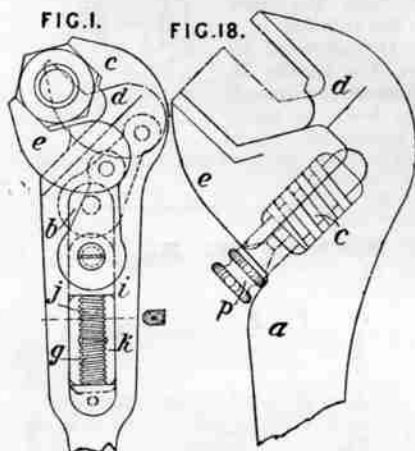


**Files; file-cutting machines.**—Round and half-round files are made with continuous spiral cutting-edges by means of one or more disc cutters  $i$ , Fig. 2, inclined slightly to feed the file past the cutters as they or it are rotated. The semi-circular stems  $f, g$ , carrying the cutter  $i$  and a gauge disc  $j$  which bear against the uncut part of the file and clear the burr formed by the cutter  $i$ , are adjusted relatively to each other by a screw  $h$ , are pressed towards the file by a spring  $t$ , and can be rotated in the support  $e$  to vary the feed by a pin  $o$  and a fork-ended lever  $l$ , pivoted at  $m$  and locked in any position by a screw  $p$ . As the part of the file operated upon increases in size the pin  $o$  moving in the slotted lever rotates the stems  $f, g$  to increase the feed, and vice versa. The file  $c$  fixed in a chuck  $b$ , or a number of half-round files with their flat faces against a polygonal bar



and are rotated with the sleeve *a*, the chuck rising automatically or with a positive motion. Chisels *u*, Fig. 6, with inclined edges and adjustable gauges *v* are used for cutting polygonal files, the chisels being reciprocated simultaneously by springs *s*, pins *r*, and cam projections on the sleeve *a*, and the file being lifted along with the chuck *b* with a variable velocity by means of the crank lever as shown.

**457. Clark, W.,** [Samuel P. A.]. Feb. 17.



*Spanners and wrenches.*—The jaw *e* of a wrench is moved on or in the inclined part *d* of the shank *a* and jaw *c* by a screw either directly as shown in Fig. 18, the tops of the threads being roughened or a knob *p* being provided, or by means of one or two links, shown in Fig. 1, pivoted to a sliding block *i*. The block *i* may be slid in a recess in the shank by a right and left handed nut *k* working on a fixed screw *g* and a screw *j* fixed to the block, or by a screw working in the block *i* and having a stem passing through the shank and terminating in a handle. The block *i* may embrace the shank and carry a screw engaging teeth on the back of the shank.

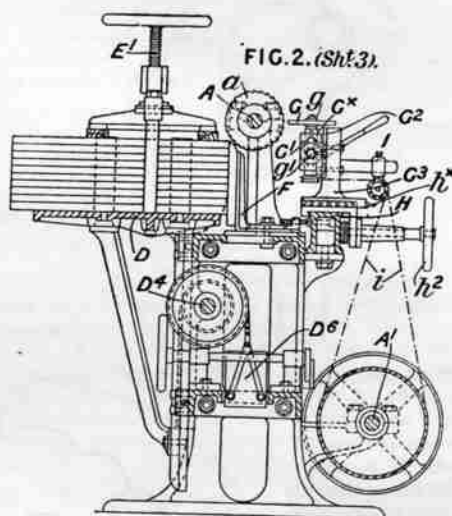
**565. Weigmann, G.,** [Kunstmann, R.]. Feb. 28. [Provisional protection only.]

*Dies.*—The hole through a screw-cutting die is made conical, the cutting teeth being on three or more sharp-edged ribs.

**640. Wimshurst, H. W.** March 7.

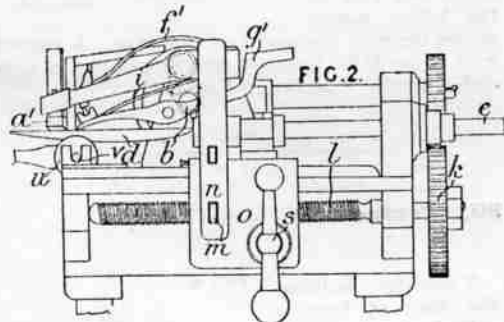
*Saws, sharpening.*—A disc *G* for sharpening the saws *a* of a machine for tonguing and grooving corner and butt joints for boxes, drawers, planks, &c., and made as described in Specification No. 1062, A.D. 1864, [Abridgment Class Grinding or abrading &c.], is mounted on a spindle rotated by band *i* from a drum on the main shaft *A*<sup>1</sup>, the bearing *G*<sup>2</sup> being capable of being slid by a

lever *I* in a socket *G*<sup>1</sup> pivoted at *g*<sup>1</sup> to a bracket *G*<sup>2</sup>, the support *G*<sup>3</sup> of which can be moved along a slide *H* and past the saws by



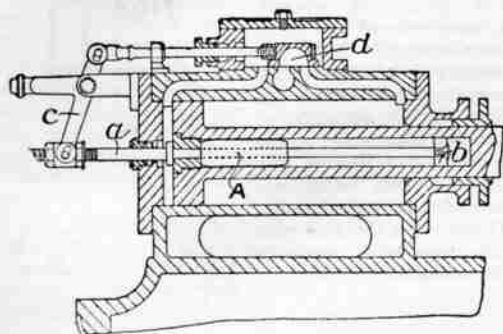
means of a rope and a hand-wheel *h*<sup>2</sup>, and moved towards the saws by a screw *h*<sup>3</sup>. A divided ring is secured to one end of the saw spindle *A*.

**885. Brookes, W.,** [Weed, A.]. March 29.



*File-cutting machines.*—The grooved anvil *u* is mounted in a semicircular bearing or on a ball pivot *v* so that the blank *d* can adjust itself to the chisel *a*<sup>1</sup> which is operated by a spring *f*<sup>1</sup> and a cam on the main shaft *b*. The shaft *e* and the blank are advanced by change gearing *k*, a screw *l*, and a half-nut *m* in the carriage *o*, but the half-nut may be withdrawn by the lever *n* and the carriage then run back by means of the handle *s* and a pinion gearing with the screw *l*. The shaft *e* may be free to rotate or be spirally or zig-zag grooved, or be rotated by gearing as it advances. The blank is held on the anvil by a spring *i* and a lever *g*<sup>1</sup> which is fitted with a wedge for limiting the depth of cut. The force exerted by the spring *f*<sup>1</sup> can be adjusted by a cam on a shaft carrying a lever which bears on a templet fixed to the carriage *o*.

## 982. Jones, J. G. April 6.



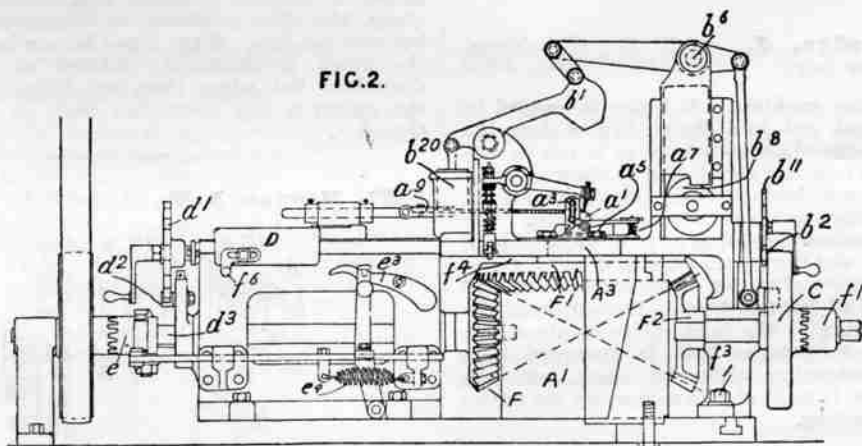
*Percussive hand tools.*—Fig. 1 shows the valve gear of a steam air or other fluid-pressure engine for giving motion to tools for cutting stone, and other materials in which the stroke is variable. The slide valve *d* is actuated by the rod *a*, which slides in the hollow piston-rod. At the end of the engine outstroke the cylinder or tappet *A*, continues to slide in the hollow piston-

rod, and strikes the collar *b*, which operates the slide valve; while on the instroke the valve is actuated by the piston striking a second collar on the rod *A*. If preferred, the tappet and rod *a* may be placed outside the engine cylinder, or the tappet may receive a rotary motion.

## 993. White, T. April 7. [Provisional protection only.]

*Handles.*—Handles for nut-crackers, lobster crackers, grape scissors, knives, spoons, and other articles, are made in skeleton, with a metal plate occupying the middle, and an ornamental edge bordering the plate and making on either side of it shallow recesses. Plates of pearl ivory, metal or other substance, are inserted in the recesses, and the edge of the ornamental border turned over. The plates are fixed in burnishing. The hollow recesses may be on one side only, and instead of making the ornamental border continuous and soldering it to the middle plate, it may be divided at its bent part, and fixed at its ends.

## 1013. Turton, T. April 8.



*File-cutting machines.*—A plug *a*<sup>1</sup> forming the anvil of a file-cutting machine, and the plate *A*<sup>5</sup> and frame *f*<sup>6</sup> carrying the hammer and the hammer-operating mechanism, can be rotated about the axis of the pillar *A*<sup>1</sup> and fixed by bolts *l* to vary the inclination of the teeth of the file. The blank is held on the anvil *a*<sup>1</sup> by an india-rubber roller *a*<sup>5</sup>, a lever *a*<sup>5</sup>, and a spring *a*<sup>7</sup>, and it has its tang gripped between the jaws of a vice *a*<sup>9</sup> swivelling in a carriage *D* which is advanced by a screw, a star-wheel *d*<sup>1</sup>, and a projection *d*<sup>2</sup> on the main shaft *d*<sup>3</sup>. At the end of the traverse, the tappet *f*<sup>6</sup> depresses the catch *e*<sup>3</sup> and the spring *e*<sup>4</sup> throws the clutch *e* out of gear and stops the machine. The hammer *b*<sup>1</sup> is operated by a spring

or an air cylinder *b*<sup>30</sup> and a cam *C* driven by a clutch *f*<sup>1</sup> and bevel gearing *F*<sup>2</sup>, *F*<sup>1</sup>, *F*, the height of the fulcrum *b*<sup>6</sup> being altered and the force of the blow therefore varied by a cam *b*<sup>8</sup> driven by a worm and worm wheel, a star wheel *b*<sup>11</sup> and a projection *b*<sup>3</sup> on the cam *C*. The chisel is lifted and depressed after and before each blow by springs and cams *f*<sup>4</sup> on the back of the wheel *F*<sup>1</sup>. When round or half-round files are being cut, the vice *a*<sup>9</sup> is rotated by a star wheel or oscillated. The shaft of the vice *a*<sup>9</sup> may be screwed and splined and carry a nut and a wheel driven by a double feed motion, or there may be two chisel-and-hammer-carrying standards.



of the shank. One end *c* of the stem *C* is made as an ordinary screwdriver but the other end *e* has a slit made across its width, and the two parts *e* thus formed are bent so as to be out of line, as shown in Fig. 3. On the end of the parts *e* are made dovetailed projections *f* which are in line when the parts *e* are not. To use the screwdriver, the projections *f* are inserted in the dovetailed slot *g* of the screw, Fig. 5, and the stem *C* is then inserted in the shank *A*. The screw *B* grips the stem and at the same time closes the slot *a* and causes the projections *f* to go out of line and thus grip the screw as shown in Fig. 4. The stem *C* can be reversed if the ordinary screwdriver *c* is required and the stem *h*, Fig. 7, can be used if no gripping-device for the screw is needed.

**1411. McNally, E.** May 23.

*Combination tools.*—In a stock, a screwing-die is mounted in a sliding-block *b*, so as to turn and abut against sides *o*, *o'* according to the direction of motion.

The edges of the die are formed to give a true cut in the direction in which they come into operation. The work is supported during cutting by dummies *e*. The die may be replaced by one with diamond points for cutting pipes or tubes.

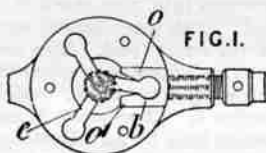


FIG. 1.

**1472. Johnson, W.** May 29.

*Vices.*—The crutch *B*, to which the movable jaw is hinged, is pivoted to the cross-bar *C* and is free to rotate when tapered objects are being gripped, but is fixed by a wedge or one or two pins *A* passed through a wing or wings on the crutch and the cross-bar when parallel objects are being gripped.

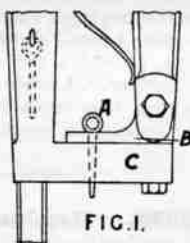
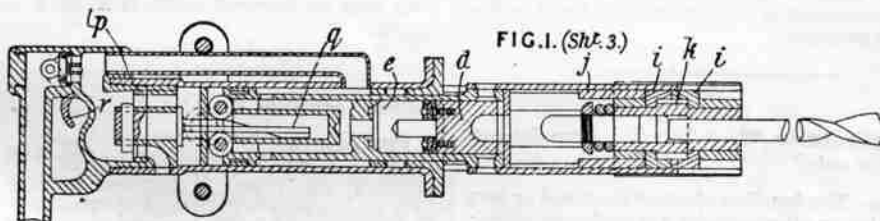


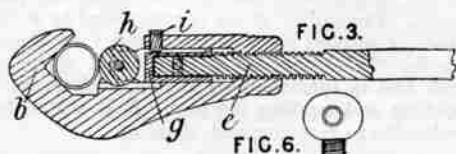
FIG. 1.

**1778. Low, G.** July 5.



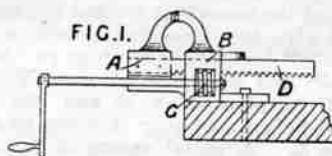
*Percussive hand tools.*—The tool is struck by a piece *d*, which is mounted loosely in the chamber *e* in the end of the piston-rod, to which

**1527. Taylor, C.** June 3.



*Pipe and rod cutters; stocks and dies; combination tools.*—The block *g*, Fig. 3, carrying the cutter *h* of a pipe or rod cutter is advanced in the tubular part and in a slide way in the open part of the head *b* by the handle *c*, which is screwed into the head *b*. A pin *i* prevents the rotation of the block *g*. The slideways *b*, Fig. 6, of a screwing-stock are made continuous and the dies in halves *c*, *c'* which are held in position by pins *e*, *f*. One half of the lower die may be advanced a distance equal to the depth of the cut, or the dies may be replaced by divided dies with single cutting-edges for cutting pipes &c.

**1761. Ehrhardt, L. H. G.** July 3.



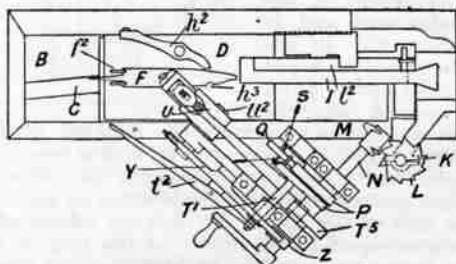
*Vices.*—One jaw *A* of a bench or a watchmaker's vice has affixed to it a rack *D*, which slides through a hole in the jaw *B* and is engaged by a worm *G* operated by a winch-handle.



from, the rear end by a disc valve *p*, which is turned by a twisted bar *q*, over which the piston works. The supply of air is controlled by a valve, which is worked by a finger-piece *r* in the rear handle. This machine is described as a rock drill, and is furnished, as shown, with means for rotating and feeding the tool. It is stated to be applicable to riveting and shaping.

1792. Clark, W., [Anden, W. van]. July 6. [Provisional protection refused.]

FIG. 4.

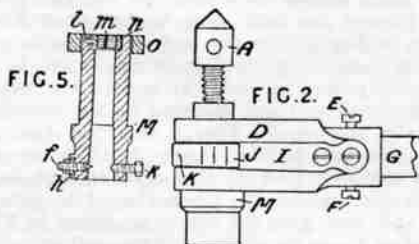


*File-cutting machines.*—The carriage D, on which a file blank F is secured by clips *f*<sup>2</sup>, a pin *h*<sup>3</sup>, and a lever *h*<sup>2</sup>, has a projection engaging a groove C in the bed B and engages the inclined side *l*<sup>2</sup> of a triangular frame I which is slid vertically by a nut, a screw K, a star wheel L, and a worm M on the main shaft N. The nut may be thrown into or out of gear with the screw K by means of a treadle, and the worm M is divided and the cam T<sup>5</sup> provided with two objective points so that the blank F shall be stationary while two blows are being delivered to form each cut. The chisel-holder U is pivoted at *u*<sup>2</sup> and the chisel is depressed before each pair of blows by a lever Y and a cam Z. A spiral spring S has one end secured to the hammer pivot and the other to a loose ratchet-wheel Q which is rotated by pawls P until the cutting of the tapered part of the blank is finished when the pawls are lifted by pins. The hammer may be kept lifted and the pawls withdrawn by a bar T<sup>1</sup> and a lever *t*<sup>2</sup>, allowing the wheel Q to return to an adjustable starting point. The spring S may be attached to the wheel Q and to the machine frame, and the cam T<sup>5</sup> may have only one objective point. The chisel is secured by a screw between side blocks of india-rubber which allow the cutter to accommodate itself to the surface of the blank.

1798. Sheldon, T. July 7. [Provisional protection only.]

*Handles.*—The handles of smoothing, sad or box irons, kettles or other articles are made as follows:—Short bars of wrought iron of any size and shape are inserted in the ends of a mould of the shape desired for the handle and cast iron is poured in. If desired, the middle of the handle may be cored.

2312. Davies, E., and Taunton, R. H. Aug. 28.



*Combination tools.*—A ratchet brace is turned by a lever handle G, Fig. 2, or by a brace handle. In the latter case the brace handle carries the feed screw A. The lever or brace handle may be solid or hollow, e.g. of gas piping, and may be screwed into the stock D, or secured by screws E, F. The lever handle may be fitted with a claw at its outer end. The socket M may be fitted with an adjustable collar O, Fig. 5, for receiving screwing-dies *m*, *n*, which are adjusted by a wedge *l*. The socket M may also be fitted with a cutter held by an adjusting screw *f* turning in a nut secured by a collar *h*. The work is adjusted to the cutter by a screw K.

2396. Dufrené, H. A., [Bourquin, C.]. Sept. 20. [Provisional protection only.]

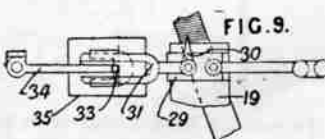
*Spanners and wrenches.*—A spanner for tightening nuts of any form or dimensions consists of a pair of jaws, one of which slides in a groove in the other, and an arm or lever, turning on a fixed axis, and carrying a small knob at its extremity which enters a small slot in the lower part of the movable jaw, in such a way that the lever and jaw move together. A spring is attached to the pivot on which the movable jaw turns to return the jaw to its original position when displaced.

2539. Heydon, J. Oct. 3. [Provisional protection only.]

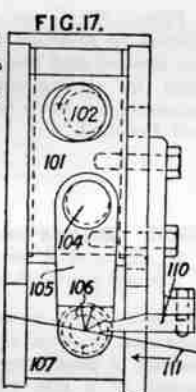
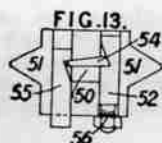
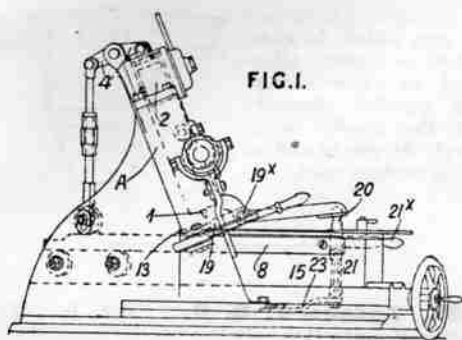
*Bench fittings.*—A metal bench-stop has a thin square head with edges notched and bevelled on the underside, and a square recess to receive a key by which it is screwed into or out of a square-flanged metal socket let into the bench. The stop may be lowered until it is flush with the bench.

2548. Dodge, J. Oct. 4.

*File-cutting machines.*—The chisel 1, Fig. 1, of a file-cutting machine is operated positively or by a cam shaft and a spring pre-



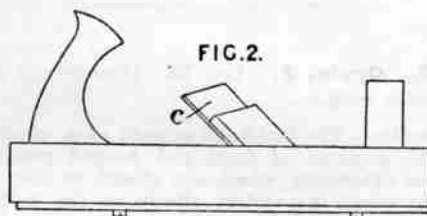




ferably of india-rubber, within a cylinder 2, the strength of blow being varied by means of a lever 4 and a templet 8 secured to the travelling carriage 15. When the chisel is operated by steam or air &c., the templet controls the admission and release of such fluid. A finger 19 is pressed down by a spring 23 upon the blank 13 and causes the file-bed to rock transversely in the carriage 15 until the blank is parallel to the chisel-edge, one of the bearings 19<sup>x</sup> of the finger pivot being an eccentrically-situated hole in a worm wheel which is rotated to bring the top of the finger parallel to the chisel-edge. The toggles 20, 21 are bent to free the blank by a lever 21<sup>x</sup>. A block 29, Fig. 9, reciprocated in a groove in the finger 19 carries a bell-crank lever one arm 30 of which traverses each cut, and, if arrested by any fault, causes the forked arm 31 to move a lever 34 until its pin 33 comes opposite one of the slots of a horseshoe-slotted plate 35, and allows a spring to pull the lever 34 and to throw a clutch on the main shaft out of gear, thus stopping the machine. The chisel 106, Fig. 17, is secured in its holder 51 by a wedge 54 which is advanced and retracted by other wedges 52, 55 and a screw 56. The V-guides for the holder 51 are adjustable in the standard A, Fig. 1, to compensate for wear by wedges of approximately the same length as the guides, and a layer of india-rubber, felt &c. is placed between the main frame and the foundation to give the bed elasticity and prevent the chisel from rebounding. A chisel 106, Fig. 17, which will cut and upset the teeth is mounted in a holder 105 pivoted in line with the chisel-edge to sliding blocks 107, and reciprocated by an eccentric pin 104 mounted in a block 101 fitted with a finger 110 resting on the blank. The finger is kept in contact with the blank by a very heavy weight or a smaller weight and an eccentric pin 102, but in the latter case the blank should be inclined as at 111 on the

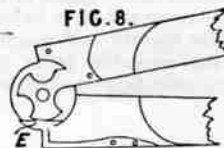
horizontally-moving bed so that the block 101 will not have to be lifted by the blank. According to the Provisional Specification, the carriage 15 may be traversed by spur gearing with a quick return motion, the feeler 30 may feel the edge of the chisel or rotate in contact with a rotary cutter, or, mechanism may be provided for stopping the bed at the end of each stroke.

#### 2577. Machin, T. Oct. 6.



*Planes.*—A number of irons or cutters are set obliquely in a plane to cut a number of shavings, for spills, at one traverse. The plane shown in Fig. 2 has one cutter *c* only.

#### 2613. Nicholls, A. Oct. 10.



#### Bevels and mitres.

—“Gauges,” tailors’

squares, and other

articles which it is

desired to adjust

at various angles,

are provided with

hinges constructed

to retain the

articles in various

positions. The

middle plate or

piece of the hinge

is polygonal, or of a similar

shape, and moves against a spring which holds

the hinge in position; or a screw passing through

the middle plate holds the hinge. Figs. 4, 8, 10,

and 11 show various hinges applied to rules. In

the hinge shown in Fig. 4, the spring *E* is

provided with a tongue *e* which engages with notches

on the middle plate, the spring *g* pressing the

“thumb spring” *E* against this plate. In the

hinge shown in Fig. 8, a single spring *E* is used.

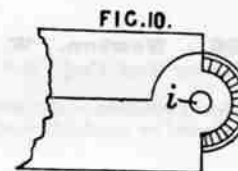
Figs. 10 and 11 show a hinge graduated to show

the angle to which the limbs are opened out, the

rule being held in this position by a screw *i* with

a milled head, which is gripped by a recessed

screw in the middle plate.



**2671. McGrah, T.** Oct. 16.

*Handles.*—The handles of table knives and forks and of putty, palette, &c. knives are secured to the tangs by means of sulphur. If the handles are of ivory or bone, powdered whiting, gypsum, or other light-coloured and similar substance, is added to the molten sulphur. If the handles are black, any ingredient that has a tendency to thicken the sulphur is added. The sulphur is poured into the bore of the handle and the roughened tangs inserted.

**2735. Orvis, J.** Oct. 23. [Provisional protection only.]

*Handles.*—The tool-holding part of a stock or handle consists of fixed and hinged portions, conical externally, which are closed to grip the tool by means of a sliding sleeve, or the holding part is slotted and fitted with arms or claws which are similarly closed by a sliding sleeve.

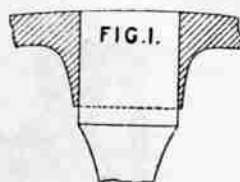
**2783. Buckingham, J.,** [Churchill, C.]. Oct. 28. [Provisional protection only.]

*Spanners and wrenches.*—One jaw of a wrench is moved on the shank of the other jaw by a headed screw mounted in a bearing projecting from the handle ferrule and engaging a nut in or secured to the movable jaw. A clip surrounding the shank may be attached to the free end of the nut.

**2796. Newton, W. E.,** [Incorporated Washoe Tool Co.]. Oct. 30.

*Picks; handles.*—The ends of a miner's pick are connected by gradually-curved parts to the socket

or eye, which is elongated as shown, elliptical in cross-section, and parallel throughout, the handle being simply driven in and no fixing wedges used.

**2887. Lassus, J. B. O.** Nov. 8. [Provisional protection only.]

*Files.*—Worn-out files to be sharpened are dipped in hydrochloric acid which removes rust, are washed and then dipped in dilute nitric acid, then in strong nitric acid to which a little ammonia has been added, and are finally washed and brushed.

**3036. Baragwanath, J. P.,** [Baragwanath, H. H., and Wisker, M. van.]. Nov. 27. [Provisional protection only.]

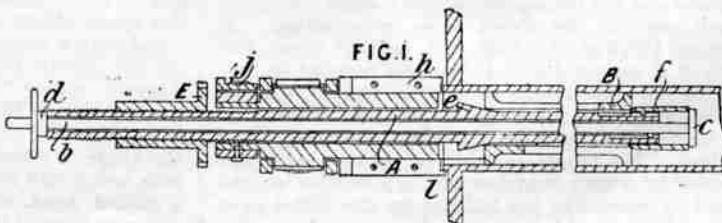
*Combination tools.*—One jaw of a spanner is socketed to receive the shank of a pipe-cutting tool or a pipe-gripping jaw and is adjusted by means of a nut which engages threads on the edges of the tool shank. The cutter or extra jaw may be retained by a spring catch.

**3165. Bousfield, G. T.,** [Chambers, A.]. Dec. 8. [Provisional protection only.]

*File-cutting machines.*—In order that the chisel of a file-cutting machine may strike all parts of the surface of a half-round or tapered file evenly and at the same angle, the bed is rocked by means controlled by the blank itself, a pattern of the same, or by cams, and has its inclination varied by cams, eccentrics, or templets.

**3214. Newton, A. V.,** [Nichols, D. M.]. Dec. 12.

*Pipe cutters; pipe trimmers.*—A tool for cutting boiler tubes to the required length has its cutter-head C rotated by a spanner or a ratchet-lever on a hollow spindle A, held concentric with the tube by a sleeve B, which is expanded by scrolls or cams or by the cones e, f, the rod b, and the nut d. The cutters h may be fed

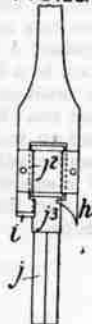


radially or longitudinally as shown by a weight, a spring, ratchet mechanism, or by a nut E which may be locked to the head C by a sliding bolt j. The extent to which the cutters project in front of the head C determines the size of the cut, and projections l to contact with the tube-plate limit the traverse.

### 3290. Martin, J. Dec. 20.

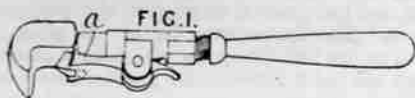
Wood-boring bits for use for making holes in doors to receive the central bosses of the bearing plates for the knobs &c. The bit is formed with a loose square spindle j to engage in the spindle hole in the lock or is recessed to receive the knob spindle as a centre. The spindle j is shouldered at j<sup>s</sup> to act as a guide, and is mounted in bearings j<sup>2</sup> so as to allow the cutters h, i to form a hole concentric with the spindle.

FIG. 20.



## A.D. 1866

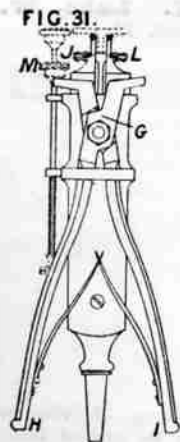
### 68. Grimshaw, W. D. Jan. 9. [Provisional protection only.]



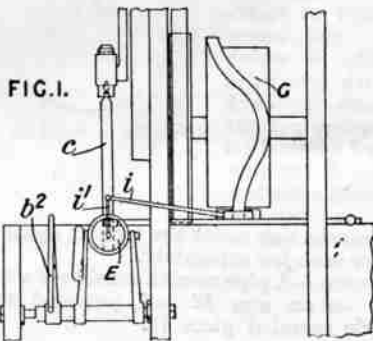
Combination tools.—The movable jaw a of a wrench for metal tubes and rods is socketed to receive a cutter as shown in Fig. 1.

### 257. Roux, F. L. Jan. 26.

Combination tools.—Consists of tools for applying copper sheathing to iron ships in combination with an insulating material of the kind described in Specification No. 728, A.D. 1864, [Abridgment Class Ships &c., Div. I.]. A detailed description is given of the operations performed. A combination hand tool, Fig. 31, is described, comprising a spring boring-bit, a brush J, L for cleaning the bit, a pair of pincers H, G, I, and a marker M for marking the rivet holes with paint through the sheathing, which is used as a template.

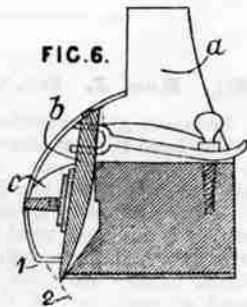


### 288. Dalhoff, J. B. Jan. 30.



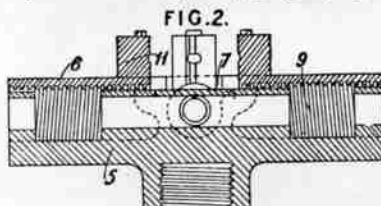
#### File-cutting machines.

—A file c, Fig. 1, preparatory to being cut with a straight-edged chisel is reciprocated by a crank between two sets of planing-cutters, mounted in boxes which are oscillated through an angle equal to twice the inclination of the file-teeth in outer boxes E by means of levers i<sup>1</sup>, rods i, and a cam G. The boxes E are immersed in oil or water and are pressed together by weights on bent levers b<sup>2</sup>. Discs of india-rubber may be interposed between the backs of the inner and outer boxes, and plates of lead



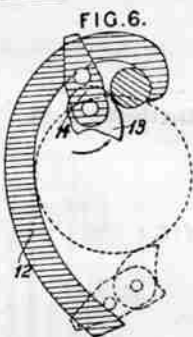
between the cutters. The chisel *b*, Fig. 6, for cutting the teeth has a curved back in contact at the top and bottom with the holder *a* or rests against a block with a curved back which can rock to a limited extent in the holder, and is held in position by a hoop or clamp *c* between which and the chisel is a round plate with a pointed top and an india-rubber plate. The hoop and chisel can be adjusted laterally in the holder by means of a screw, and the chisel may have a small facet on the line 1, 2 to determine the shape of the teeth.

**337. Mackintosh, W., [Taylor, J.]. Feb. 3.**



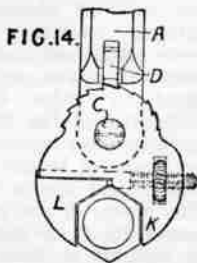
*Vices.*—A vice consists of a face-plate 5, with four grooved guide-ways to receive the jaw-plates 6, 7 at right-angles, the screw segments of which gear with two pairs of screws 9, each pair having a right and left handed thread. A key provided with a feather fitting in grooves in the screws may move the jaws 11 towards each other, or each jaw separately.

*Wrenches.*—A pipe wrench consists of a block 14 sliding on an arm 12 and provided with an eccentric serrated piece 13.



**391. Roe, J. Feb. 8.**

*Spanners and wrenches.*—The head *K* of a screw-wrench or spanner is pivoted at *C* to the handle *A* and is rotated by means of a spring-pressed pawl *D* when the handle is oscillated. There may be a head at each end of the handle, one jaw *L* may be adjustable, or the head may rotate completely in a socket in the handle.

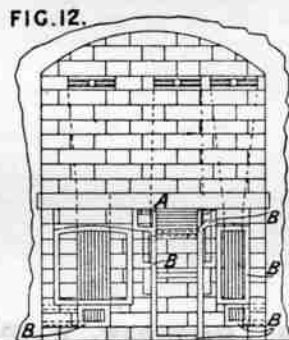
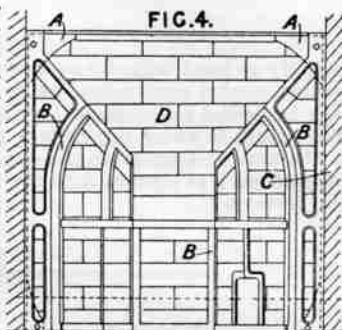


**445. Young, W. Feb. 13.**

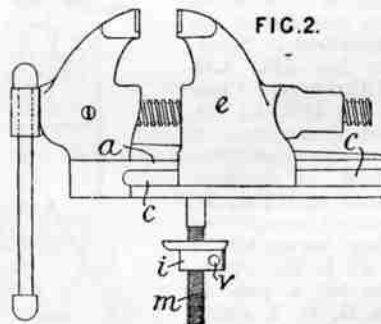
*Tools for setting-out work.*—

Consists in the employment of a templet, corresponding in form with the back of a grate or kitchener, to serve as a guide for building or forming a suitable foundation or backing, of brickwork or concrete, for the grate.

One form of templet, shown in Fig. 4, is composed of a permanent frame *A*, fixed to the brickwork *C*, and a temporary skeleton frame *B*, behind which is built the brickwork or concrete *D*. The temporary frame *B* is removed after the foundation or backing has been formed, and the grate is secured to the permanent frame *A*. The frame may be in one piece, and secured to the brickwork, in which case after the backing has been formed the grate is secured to the frame. A templet may also be employed to form the foundation for a kitchener, as shown in Fig. 12, in which case a permanent frame *A*, and a skeleton frame *B* to form the spaces for the oven, fireplace, boiler, and flues, are employed.



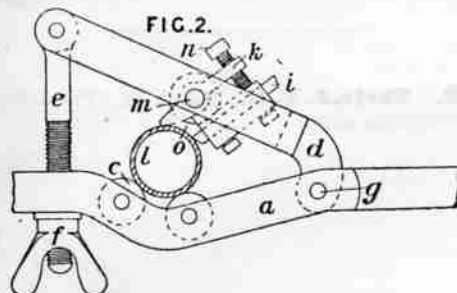
**457. Lake, W. R., [Brainard, A. H.]. Feb. 13.**



*Vices.*—A vice, which, while carrying work, may be moved from a bench to a planing, drilling, or other machine, has two external grooves *c* in its base *a* for guiding the jaw *e*, and an inner

T-shaped groove for receiving the head of the fixing-bolt *m*. The nut *i* is shaped to fit a spanner and has a hole *v* for a tommy-bar.

**506. Wolstenholme, J., and Pendlebury, J. T.** Feb. 17.



**Combination tools.**—An apparatus for shaving gas pipes, mill shafts, pillars, and other tubes or bars, and for cutting them to length, consists of a wrench *a*, in a slot in which are rollers *c* to support the work *l*. At *g* is pivoted a slotted arm *d* provided with an adjusting screw *e* and a nut, and having centered on the pin *m* a box for the shaving and cutting tool *t* and an adjusting plate *k* regulated by a screw *n*. By the action of the screw *e* and the turning round of the wrench *a* the metal may be cut by the revolving cutter *o*, as described in Specification No. 3213, A.D. 1864. The tool *t* may have a parting-edge at one end and a broad cutting-edge at the other.

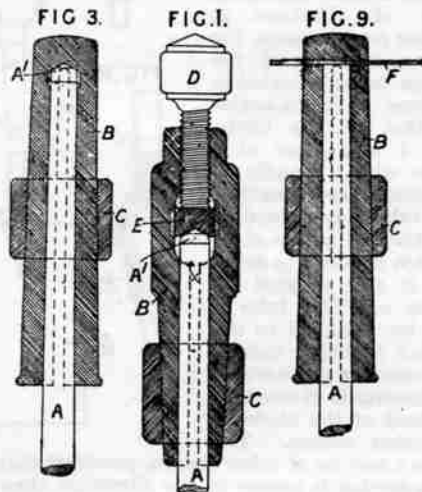
**604. Eden, F. M.** Feb. 27. [Provisional protection only.]

**Percussive hand tools; chisels.**—A chisel for cutting stone, marble and similar material, or a hammer or tool for closing rivets, is fixed in one end of a piston-rod working through both ends of a compressed air or steam cylinder provided with handles. The other end of the rod acts on two spiral springs which move the valve-rod. The apparatus is suspended from a beam by india-rubber or other elastic springs or cords with buckles and straps.

**609. Hick, J.** Feb. 28.

**Clamps.**—The tips of billiard and like cues are firmly held to the cue by a clamping device while the fixing glue or cement is setting. The cue *A*, Figs. 1, 3, is embraced by a wooden sleeve *B*, which is divided longitudinally by two or more slots, and is provided with a sliding collar *C* by means of which the sleeve is securely held to the cue. The tip *A*<sup>1</sup>, Fig. 1, is held in position by a sliding plug *E* having a conical recess which is

forced over the tip by a screw plug *D*. As shown in Fig. 3, the plug *E* is dispensed with, and a conical recess is formed in the sleeve *B* to bear upon the tip while it sets. Fig. 9 shows a similar clamping device which is used to hold a cue *A* while the cue end is squared by means of a file *F*.

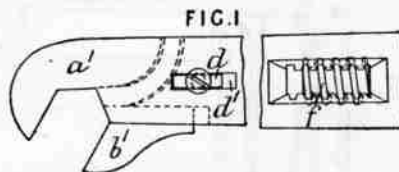


working in a slot formed in the sleeve *B*. Other forms of clamps may be used, such as one having a spring "between the tip and the butt," or the bore may be square with grooves cut diagonally, or the sleeve may be formed with a taper thread and corresponding nut.

**649. Spear, J.** March 3. [Provisional protection only.]

**Vices.**—One or both gripping parts of a vice are pivoted in the jaws or legs so as to hold tapered articles, and have their motions limited by cottars or bolts &c.

**697. Chandler, H.** March 7.

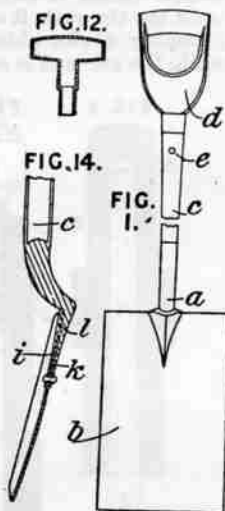


**Spanners.**—The two parts *a*<sup>1</sup>, *b*<sup>1</sup> of a single or a double ended screw-key are moved relatively to each other, to adjust the jaws by wedges and screws, by a disc mounted in one part and having an eccentric pin engaging a recess in the other part, or by means of a screw *f* which can rotate in one part and transverse in a toothed slot in the other, the parts being guided by projections *d* and slots *d*<sup>1</sup>.



**761. Yates, J. W.** March 14.

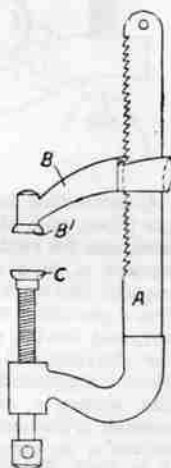
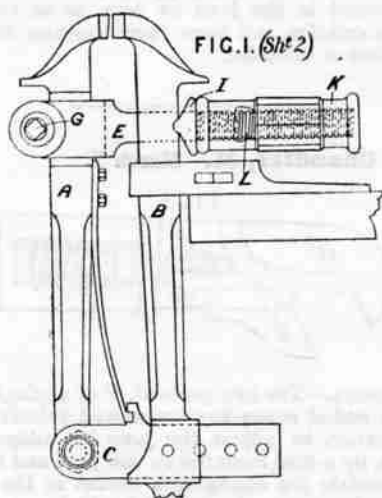
*Handles.*—The main part of the handle of a spade, shovel, fork, or other tool with a similar handle is made of a metal tube of elliptical or similar cross-section, the longer diameter of the ellipse being situated in a plane at right-angles to that of the blade. Fig. 1 is a view of a spade with a handle of elliptical cross-section. The tube *c* is welded to the tang *a*, and a short wooden handle *d* is fitted into it and secured by rivets *e*. The tube *c* may be attached to the blade *b* by being welded to a strap or plate which is afterwards riveted to the back of the blade or by other means. The tubes *c* may be of other shapes, provided that the cross-section is longer in one direction than the other. Fig. 12 is a sectional view of a cast-metal handle which may be substituted for the wooden handle *d*. It is fixed by shrinking the tubular handle upon it. Fig. 14 shows another method of attaching the tubular handle to the blade. Two plates *k, i*, are welded together and to the tube *c* and the blade is riveted between them, after a curved portion has been cut away from it at *l*.



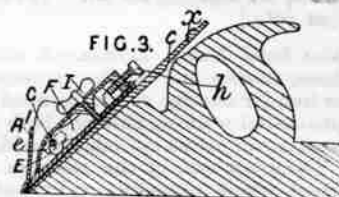
and either passes through the front jaw *A* or is forked to clear it and is fitted with a square-ended eccentric-shaft *G* for operating the jaw. The adjusting-nut *L* and its extension *K* completely cover the screw-thread, and when the jaw *A* is hinged, a washer *I* with a cylindrical bearing-surface is interposed between the nut and the jaw *B*, and the bar *c* may be adjustable.

**918. Carle, J. F. C.** March 29. [Provisional protection only.]

*Cramps.*—The bar *A* and the socketed arm *B* of a joiner's cramp are toothed so as to securely interlock when the work is screwed up between the jaws *B', C*.

**836. Parker, C. H., and Rossell, H.** March 21.

*Vices.*—The screw *E* of a bench, machine, parallel, or other vice is threaded at its back end,

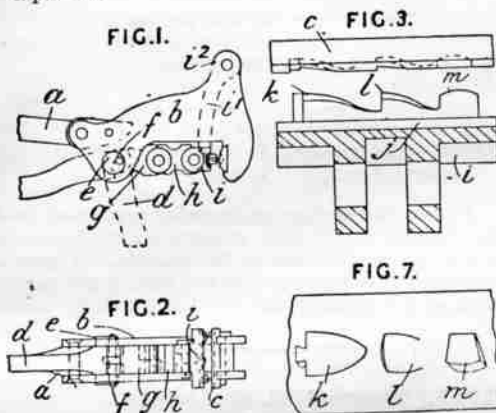
**973. Müller, G.** April 5.

*Planes.*—The cutter *C* of a carpenter's plane for planing into corners is secured with its cutting-edge in front of the stock or behind a metal throat piece *A'* by means of a screw *I* and a lever or box *E*, the fulcrum pin *G* of which passes through slots *e* in the box and carries a fork *F*. The box fits between lugs on the cap iron *D* and along with the cap-iron and cutter is adjusted longitudinally by a screw *h* which abuts against the fork *F*, and angularly by two screws, one on each side of the screw *h*, which are threaded into the fork *F*. A boss *x* facilitates the setting &c. of the cutter.

985. Taylor, W. R., and Hewett, G.  
April 5. [Provisional protection only.]

*Handles.*—The shovels employed in moving malt are tipped with india-rubber or other soft or yielding material, or are made entirely of such material.

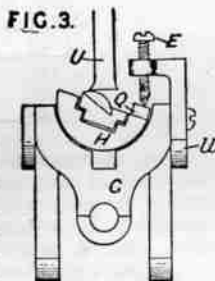
1097. Holmes, J., and Slack, J. C. H.  
April 19.



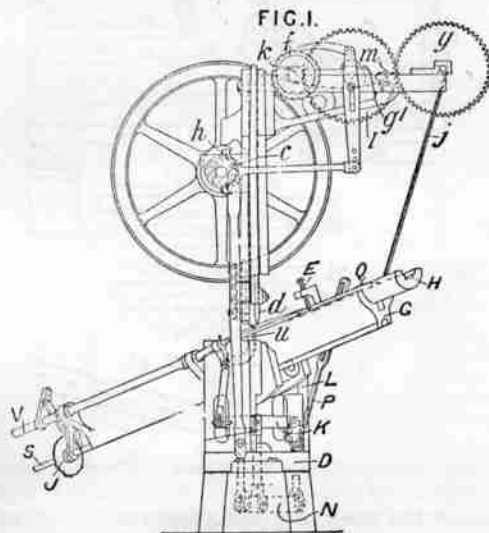
*Punching-pliers* for fastening together the ends of hoops or bands of cotton bales. The projections *k*, *l*, *m*, Figs. 1, 2, and 3, of the punch *j* fixed in the block *i* are forced by means of the lever *d* through the ends of the hoop into corresponding recesses, Fig. 7, in the die *c*, which is dovetailed in the frame *b* forged to the lever *a*. On releasing the pressure to which the bale has been subjected, the bale expands and tightens the joint. The lever *d* is hinged to the frame *b* by the fulcrum stud *e*, through which passes eccentrically the stud *f* to form the joint of the toggle link *g*. The other end of the link *g* is joined to the second link *h* connected with the block *i*, which has an arm *i*<sup>2</sup> jointed to the stud *i*<sup>2</sup>. By this arrangement, the punch descends rapidly on the die, until the stud *f* comes into action and gives greater leverage during the final compression.

1507. Bousfield, G. T., [Chambers, A.].  
May 30.

*File-cutting machines.*—In a file-cutting machine in which the bed *G* is trunnioned at *u* in up-rights *L* from a swivelling plate *D*, the inclination of the bed is varied to present the part of the blank operated on at one particular angle to the chisel *d* by cams or by a cord *j*, and the blank rest *H* is rocked in the bed by means of a cam or templet *Q* to present



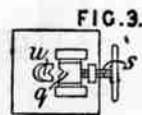
the curved faces and edges of half-round files fairly to the chisel. The chisel is operated by a cam *h* and a spring *m*, the force of which is varied by a cam *g*<sup>1</sup>, gearing *l*, *k*, ratchet mechanism *f*, and an eccentric *c*. The wheel *l* drives another wheel *y* and by reversing gearing either winds or unwinds the cord *j* and alters the inclination of the bed *G* between limits determined by stops in a link *P*. The rest *H* is advanced by a rack, a



worm on a shaft *S*, ratchet gearing *J*, and a lever *K* which is connected by a swivelling rod, in line with the axis of the plate *D*, to a lever *N* connected with a crank on the main shaft. The blank is held down by a foot *U*, and the templet *Q* is secured to the rest *H* and engaged by a screw *E* or an index stud perforated at intervals. After each row of teeth, and before the next row is cut, the screw *E* or the stud is lowered, the latter being secured by a pin through one of its holes.

1574. Newton, W. E., [Lyon, W., Isaacs, D. van G., McAndrew, A., and Wann, S.].  
June 7.

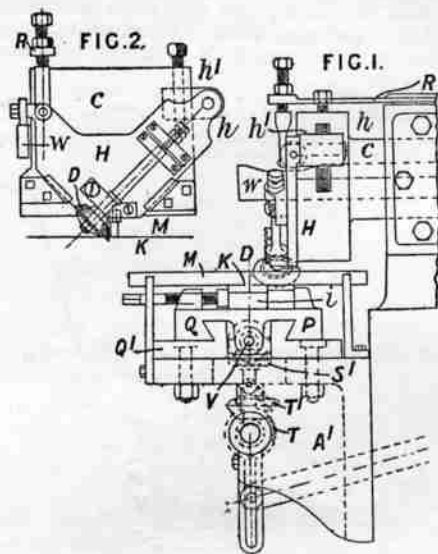
*Vices.*—In a drilling-machine, a device for holding the work consists of a fixed jaw *u*, and a sliding jaw *q*, actuated by a screw *S*.



1596. Limet, P. H. June 12.

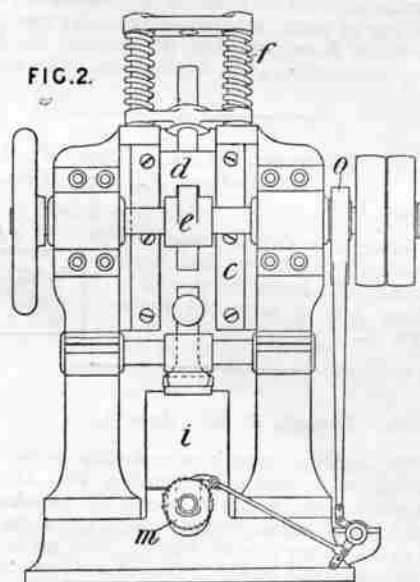
*File-cutting machines.*—A file is cut by a curved or a round impressing tool *D* with a bevelled edge, which is rotatably mounted on a plate *H* and is reciprocated with the slide *C* and by cranks over the file blank. The plate *H* may move vertically on the slide and be depressed by a spring, or be pivoted at *h* in line with the axis of the tool to a block *h*<sup>1</sup>, which is vertically adjust-

able in the slide C, and may be depressed by a spring R. At the end of each stroke an incline on a rod *w* raises the plate H and thus removes the downward pressure on the rule M, which holds the blank K firmly on the block of zinc &c. *i*, or on



one of the faces of a four-faced rotary rest, and the carriage P is advanced by the screw V, bevel and ratchet gearing S<sup>1</sup>, T<sup>1</sup>, T and a cam. The bed-plate Q<sup>1</sup> is angularly adjustable on the bracket A<sup>1</sup>.

1715. Henshall, J. June 27.



*File-cutting machines.*—The chisel-holder *d* of a file-cutting machine is reciprocated by a cam *e*

and springs *f* and works loosely in the inclined guides *c* so that it can vibrate when the chisel strikes the blank to turn up the tooth. The bed *i* is advanced by ratchet mechanism *m* and an eccentric *o*.

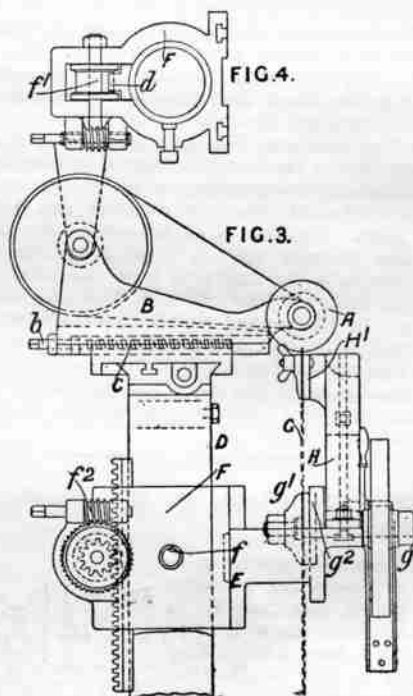
1765. Adkins, W. July 3. [Provisional protection only.]

*Taps; dies.*—Taps and dies are made with acute cutting edges, of helical form, and the lower ends of taps have two cutting edges.

1904. Morgan, J. July 21. [Provisional protection only.]

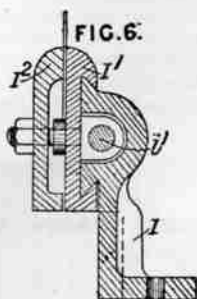
*Pincers for sealing up cans for preserved foods* by nipping a vent tube comprise a fixed jaw and a spring jaw secured to the handle. A cam or eccentric lever is hinged to the handle and presses against the spring jaw.

1943. Bantall, E. H. July 26.



*Saws, sharpening.*—For cutting or sharpening the teeth of circular saws at any inclination, a cutter A rotates in bearings on a carriage B traversed by a screw *b* on a table C, which slides on a screw in a turntable mounted on a hollow standard D. A frame E is attached to a collar F, secured on the pillar D by a set-screw *f*, and moved on the rack *d* fixed to

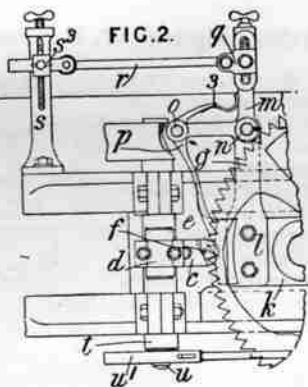
it by gearing from a worm  $f^2$ . Mounted on a spindle  $g$  on the frame  $E$ , between fixed and adjustable collars  $g^1, g^2$  is the saw  $G$  and a dividing plate which are moved intermittently and are held by a spring catch controlled by a rocking lever. The upper part of the saw is secured in an adjustable clamp  $H^1$  on the standard  $H$  bolted to the frame  $E$ . The cutter carriage may be rotated instead of the frame, by means of the turntable. For sharpening straight saws, the standard  $H$  is replaced by a bracket plate  $I$  fixed to the frame  $E$  and having a slide  $P$ , on which the saw is clamped by a plate  $P^2$ , a dividing plate being fitted on the traversing-screw  $i^2$ .



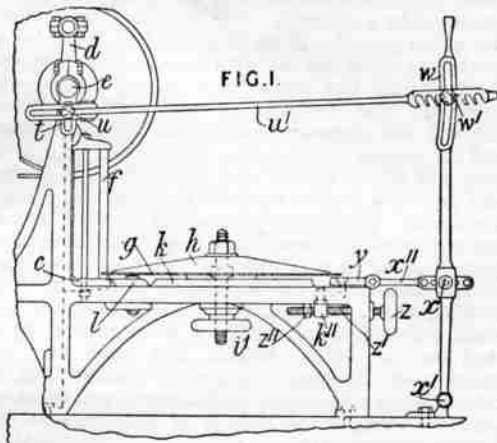
**1984. Parry, J., and Morris, R. Aug. 1.**

*Saws, sharpening.*—Circular

saws are sharpened by a file or cutter  $f$  held in a frame  $c$  reciprocated by a connecting-rod and crank  $d$  from a shaft  $e$ . Over a pin  $u$  in the slotted crank  $t$  slides a connecting-rod  $u$ , notched at the other end to drop over a pin  $w^1$  on a rocking lever  $w$ , hinged to a bracket  $x^1$  and connected by a pin  $x$  to a rod  $x^{11}$  attached to an arm  $y$ , which is bolted to the sliding table  $k$ . In



a slot in the table may slide a plate, which forms part of the screw  $i^1$  on which is placed the centre of the saw  $g$  clamped by a disc  $h$  and nut. The table is provided with a stud  $k^{11}$  which admits a screw  $z$ , and is pressed by a spring  $z^1$ , the movement being limited by a nut  $z^{11}$ , and it also carries an arm  $l$ , which supports the saw and carries a pivot  $n$ , upon which is centered a bell-



crank lever  $m$ . One limb of this lever has a pawl  $p$  centered at  $o$  and pressed by a spring against the saw teeth, and the other limb is connected by a rod  $r$  fixed by the screwed bosses  $g, s^1$  to a slotted bracket  $s$ . The pawl may be mounted on a radius arm rocked by the motion of the table, the rocking lever being pivoted to the table, and connected to an adjustable pin.

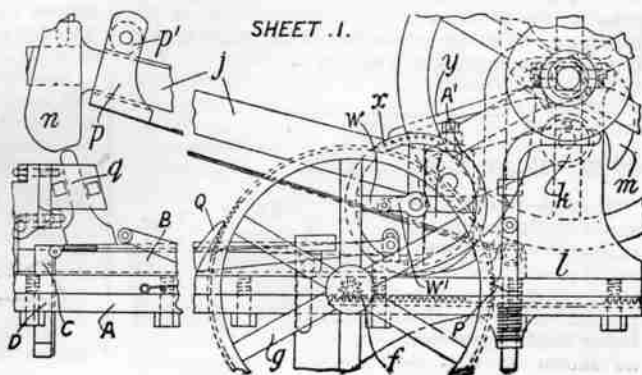
**1987. Talabot, J. Aug. 1. [Provisional protection only.]**

*Files.*—A file is made by first cutting at an angle of  $35^\circ$ , smoothing the teeth, and then forming a series of cuts at  $22^\circ$  with the first and at an inclination of  $32^\circ$  to the face.

**1992. Furness, W., and Bray, W. Aug. 2.**

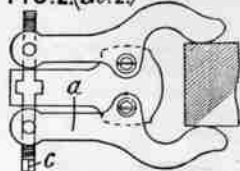
*File, rasp, and like cutting-machines.*

—A machine for cutting rasps and files has a bed  $B$  provided with holders  $C$  having shanks  $D$  passing into an anvil, provided with a rack gearing with a pinion  $j$  fixed on a shaft mounted in a slide. On a standard  $i$  fixed to the sliding plate is pivoted a lever  $j$  with a hammer  $n$ , the short arm having a friction roller  $k$  forced down by a cam  $m$  on the driving-shaft. A spring is fixed to the standard and to a guide  $p$  enclosing the hammer arm  $j$ , and a roller  $p^1$  produces the down-stroke of the hammer on to the tool  $q$ , the power of the spring being regulated

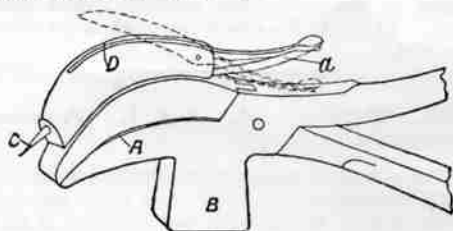


by the pressure of a cam actuated from a shaft by a ratchet and pawl. The spring may be acted on by a crank  $w^1$ , the wheel  $w$  being rotated from the main shaft by the pawl  $y$ . The feed is produced by a pinion  $f$ , the wheel  $g$  on the shaft of which is rotated by a pawl  $P$  on a rod moved by a cam on the driving-shaft against the action of a spring and check pawl  $Q$ . The fulcrum of the tool-holder is beneath the apparatus and on the sliding frame, and the socket holding the tool is set in a boss provided with a slotted face plate attached to the tool arm by a second plate, so as to set the tool at any angle. The lower portions of the face plates are regulated by a screw in a boss on the arm face plate bearing on a hub on the boss face plate. On a shaft in bearings on the sliding plate is fixed a rocking lever, for raising the tool arm out of its work, which is actuated by a lever moved by a stud on the driving wheel. For hand files or broad points, the tang is placed in a holder, Fig. 2, consisting of claws  $a$  and a set-screw  $c$ , and turning about its stem, at the bottom of which is a lever, having a screw socket for a shaft provided with a ratchet-wheel moved in a similar manner to the rocker.

FIG. 2. (Stat 2)



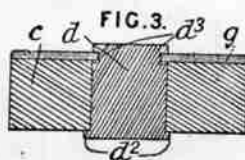
**1995. Johnson, J. H.,** [Barber, D. H., and Wells, G. M.]. Aug. 2.



**Combination tools.**—A combination tool for shoemakers' use consists of a pair of pincers  $A$ , provided on its under jaw with a hammer  $B$ , and on its upper jaw with an awl  $C$  and knife  $D$ . The knife may either be removable or permanently fitted to the pincers, in which latter case it fits into a groove in the upper jaw of the pincers and is under the control of a spring  $a$ .

**2079. Bayley, R.** Aug. 14.

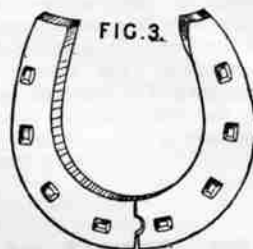
**Stocks.**—In order to screw a bolt from point to shoulder, plates used on the surfaces of a stock body are dispensed with, the dies being kept in position as shown in Fig. 3.



The stock frame  $c$  contains the fixed die  $d$  and also two movable dies, on each of which is a flange  $d^2$ , and a slot  $d^3$  sliding over the plate  $g$ . The dies may have ribs, bevelled or otherwise, moving in a slot in the frame  $c$ , or lips resting on grooves in the top of the frame, and covered by a plate.

**2080. Gedge, W. E.,** [Peillard, C. J. B.]. Aug. 14.

**Chisels.**—A cut of the shape shown is made in the toe of a horeshoe by a correspondingly-shaped chisel, the cutting-edge of which is formed to extend across the plate.



**2170. Gedge, W. E.,** [Flamm, P.]. Aug. 23.

**Saws.**—Saw teeth  $a$  are made with double cutting edges, of the form shown in Fig. 1 for light wood, and in Fig. 2 for hard wood. The links  $a$  have chamfered edges and are jointed together.

FIG. 1.

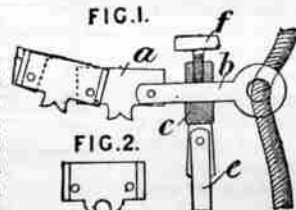
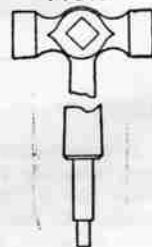


FIG. 2.



**2247. Newton, W. E.,** [Miller, J.]. Aug. 31.

FIG. 5.



**Combination tools.**—A hammer, spanner, and square key form the combination tool shown for adjusting a boring-tool for boiler tube plates.

**2365. Johnson, J. H.,** [Delong, H.]. Sept. 14.

FIG. 6.

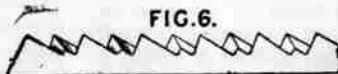
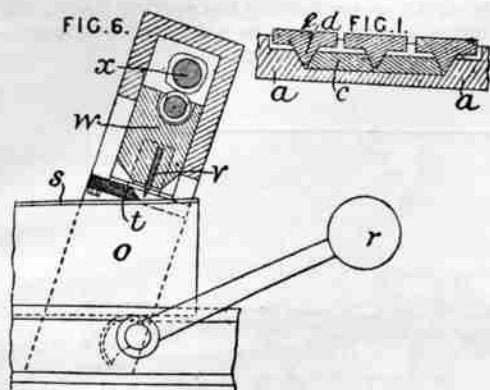


FIG. 7.

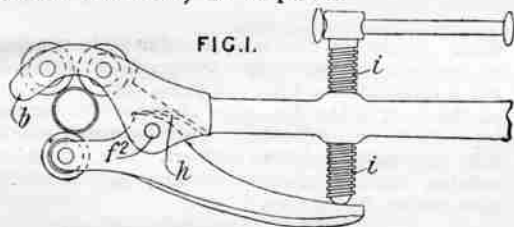


**Saws.**—Saws used in fretwork are shaped as shown in Figs. 6 and 7.



**2385. Dodge, J.** Sept. 17.

**File-cutting machines.**—Instead of beds for file-cutting machines being made of rubber or other flexible material, as described in Specification No. 2143, A.D. 1863, [Abridgment Class Grinding or abrading &c.], the bed is formed of metal plates *e*, Fig. 1, with wedge-shaped projections *d* engaging in corresponding channels formed between plates *c* and the frame *a*. The design shown may be modified. A file-cutting machine of the kind described in Specification No. 2548, A.D. 1865, has a bed *o* carrying a blank *s* and pressed upwards against a guide plate *t* by a loaded lever *r*. The cutter *v* is mounted in a slide *w* acted on by a multiple-throw cam *x*.

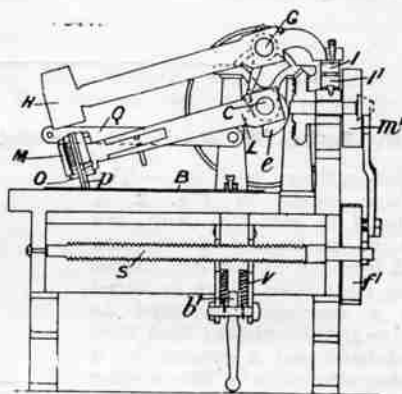
**2395. Parkes, T.** Sept. 18.

**Pipe and rod cutters.**—The claw *b* has two cutters or sharp-edged wheels. The third cutting-wheel is carried by an arm pivoted at *f²*, which is acted upon by the screw *i* and spring *h*.

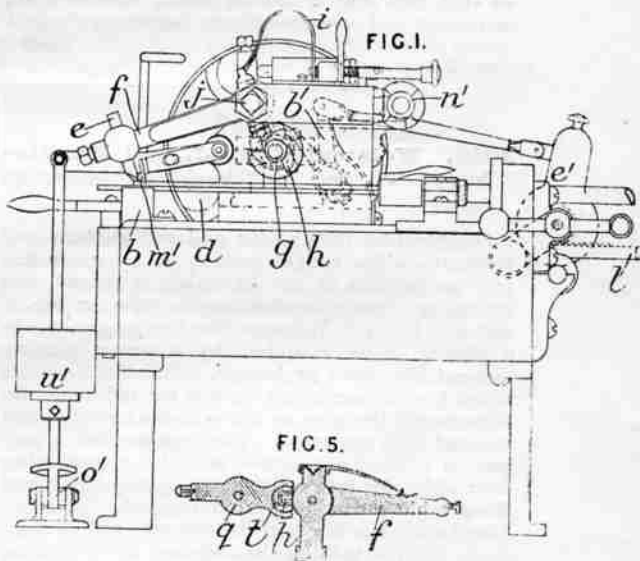
**2490. Johnson, A. F., and Griffin, M. P.** Sept. 26.

**File-cutting machines.**—The file blanks are placed on a sliding carriage *B*, and are operated on by a chisel on an arm *L*. The chisel is adjustably mounted in a rotary sleeve *O* in a tool holder *M*, fitted with a guide plate *p* arranged in advance of the chisel to ensure parallelism in the cuts. By means of a lever *Q*, the chisel and its arm can be raised from the work. The chisel is struck by a hammer *H* mounted on a shaft *G* and having a projecting end connected to a bow spring *I* which causes the hammer to give a blow

after it has been raised by a cam *e* on the driving-shaft *C*. The driving-shaft is connected by means of an adjustable crank disc *m¹* to ratchet gearing *f¹* on a screw *S*. The work-supporting



carriage has a downward projection *V* supporting jaws which can be made to engage with the screw by means of a hand-operated cam *b¹*, so that the carriage is moved forward step by step as the chisel operates on the blank.

**2548. Lake, W. R., [Weed, A.]** Oct. 3.

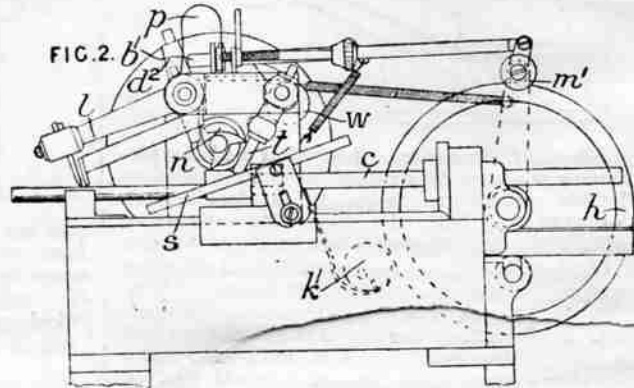
**File and rasp cutting machines.**—A machine for cutting rasps and adaptable for cutting files is shown in Fig. 1. The blank *d* is placed on a bed *b* and is fed forward by means of rack-and-pinion gearing *l* actuated by means of a cam on the driving-shaft *g*, rocking levers *b¹*, and a ratchet gear inside a casing *e¹*. A presser *m¹*, loaded with a weight *u¹*, holds the blank down, and a treadle *o¹* is provided for releasing it. The cutting-tool *e* is mounted on an arm *f* adapted to be rocked on a

shaft *j* by a cam *h* on the driving-shaft and by a spring *i* for the downward stroke. The tool is given a lateral traverse by means of a cam *u*<sup>1</sup> acting on a laterally-moving lever *q*, Fig. 5, which engages with a stud *h* on the arm *f* so that

the arm is oscillated sideways. The stud fits into a universal joint *t*. The machine is fitted with a latch device for holding the rocking levers out of action at such times as a forward movement of the blank is not required.

**2549. Lake, W. R.,** [Weed, A.]. Oct. 3.

*File-cutting machines.*—The machine shown in Fig. 2 is arranged to cut files with the cuts of increasing depth and pitch from the narrow end to the broad end. The blank is fitted into a carriage *c* adapted to receive an intermittent feed from a ratchet-wheel *h* rotated by a friction clutch *m*<sup>1</sup>. The cutter arm *l* is rocked by a cam *n*, and the down-stroke is produced by a spring *p*. An inclined lever *s* is fed forward with the blank and raises a rocker arm *t*, causing its cam *w* to compress the spring *p* so that the tool gives an increasingly severe blow. The rocker arm also raises the rod *b*<sup>1</sup> which actuates the friction clutch so that the stud *d*<sup>2</sup> acting on it increases its movement and correspondingly increases the feed



of the blank. The feed ratchet-wheel is fitted with a non-return or locking wheel *k*<sup>1</sup>.

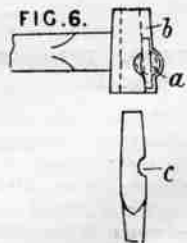
**2552. Wolstenholme, J., and Pendlebury, T.** Oct. 4. [Provisional protection only.]

*Combination tools; pipe and rod cutters and trimmers.*—The centre portion of a wrench has two projections in one of which is placed two rollers or a recess to receive the tube or bar of metal to be cut. Between the two projections is a sliding block actuated by a screw passing through the other projection. This block carries a tool-box having a cutting tool for reducing the diameter of the pipe or rod movable in a slot, and secured by a set-screw. The tool-box has a projection in front of the tool, and also a projecting part which fits into a slot in the sliding block, and is movable on a pin passed through the same. When a tube or bar is to be cut into two or more parts, the pin holding the tool-box is withdrawn, and a circular cutter, as described in Specification No. 3213, A.D. 1864, is used.

dies. Above the dies is an annular plate capable of freely rotating, in the underside of which is cut a spiral thread which engages with the teeth on the back of the dies. The plate may be turned by a knob or projection. This improvement is also applicable to tube cutters. The teeth or notches may be made on sliding pieces which give motion to the dies.

**2921. Johnson, J. H.,** [Thiercelin, E. B.]. Nov. 9.

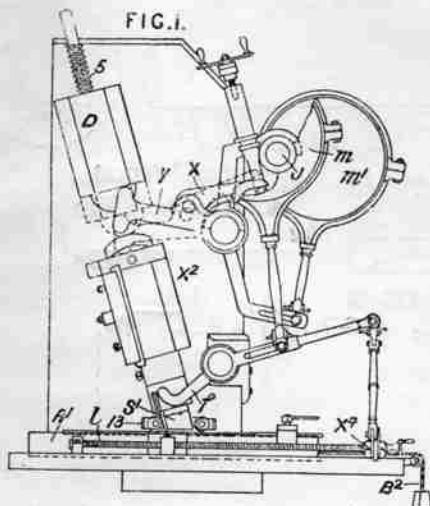
*Handles.*—Movable bits or other tools are secured to braces or handles by means of a circular pin *a*, Fig. 6, provided with a flat head to facilitate its rotation in the socket *b*. The pin enters a notch *c* in the bit or tool, and has a flat formed at one side; the tool or bit is released by bringing the flat opposite to the notch.



**2840. Chatwin, T.** Nov. 2. [Provisional protection only.]

*Taps, stocks, and dies; pipe and rod cutters.*—A series of curved teeth or notches struck from a common centre are made on the upper side of the

2944. **Johnson, J. H.**, [Comer, H., Hespenheide, W., and Rose, S.]. Nov. 10.



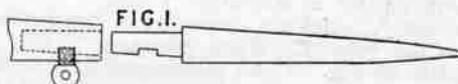
*File-cutting machines.*—The file blank is held down on its bed  $A^1$  by a frame 13 running on rollers and pressed down by a cam and lever device, while the bed is held firm by the pull of a weighted cord  $B^2$ . The feed is produced by means of a screw  $l$  fitted with a ratchet-wheel nut  $X^2$ , the ratchet being actuated by an eccentric  $m$  on the driving-shaft  $J$ . The ratchet-wheel has a peripheral shield which masks some of its teeth and regulates the action of the pawl. The cutter  $S^1$  works in guides  $X^3$  and is held in place by a spring. It is lifted by cam-actuated

rocking levers  $f$ , and the hammer  $D$  is raised by an arm  $Y$  actuated by a cam  $m^1$  and having a trigger  $X$  which is automatically released to allow the hammer, which is pressed downwards by a spring  $5$ , to strike the cutter, and so on.

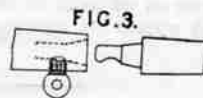
2954. **Routledge, W.**, and **Ommanney, F. F.** Nov. 12. [Provisional protection only.]

*Percussive hand tools.*—A percussive tool is attached to, or struck by, a piston working in a cylinder, to which air under pressure is distributed by a fluid-actuated piston valve. The machine is intended to work with a succession of rapid blows and it may be used for undercutting &c. rock drills, surfacing, squaring, or carving stone &c.

2973. **Dähne, F. W.**, and **Thomas, D.** Nov. 13.

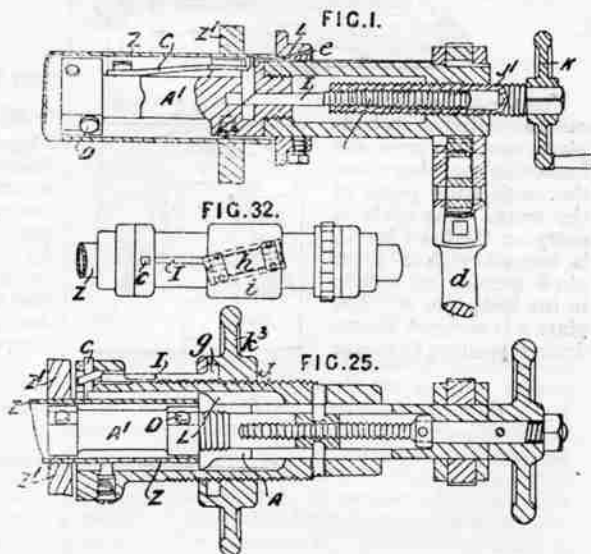


*Picks and pick-axes.*—In picks or mandrels used for cutting coal and other minerals, the points are separate from the other part of the head and fit into sockets and are secured by locking screws. Figs. 1 and 3 show two forms of joint.

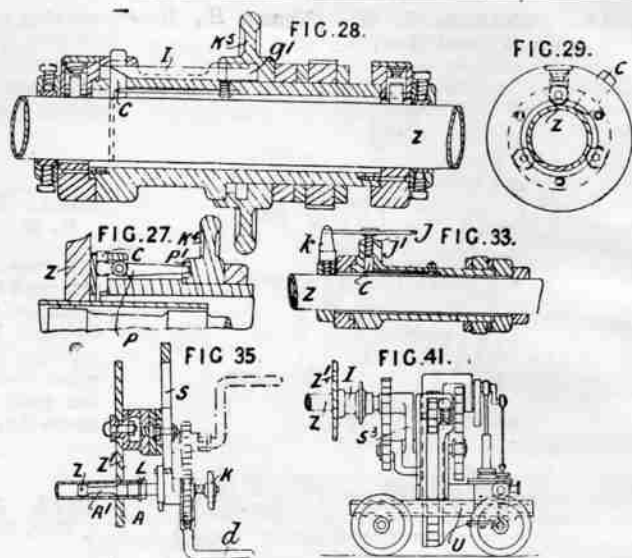


3105. **Thomson, W. R. M.**, [Thomas, N., and Somerville, T., partly]. Nov. 26.

*Pipe cutters.*—The invention comprises various forms of tube cutters which, besides being used by hand, may be mounted upon a carriage and driven by a motor, or upon the tube plate of a boiler. Fig. 1 shows an apparatus in which the cutter works from inside the tube. An interchangeable shank  $A^1$ , of a diameter to suit the size of the tube, is centered in the tube  $Z$  by screwed and spring studs  $D$ , by which it may also be adjusted to various sizes of tubes. It is rotated by a ratchet-brace  $d$ , or winch handle, and the tool is fed outwards by a wedge  $I$ , worked through differential screws  $J^1$  by a hand-wheel  $K$ . A collar  $L$  may bear against the tube to guide the cutter, or a sleeve or arm may bear against the tube plate  $Z^1$ . Lubricant may be fed to the tube through a hole  $e$ . Fig. 25 shows the cutter arranged on the outside of the tube. Many

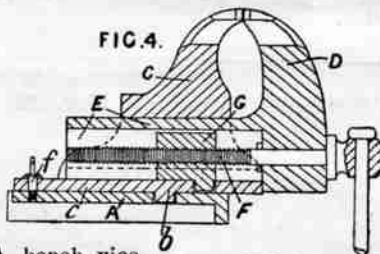


modifications are described of the forms of studs D and the way of mounting them, and of the mounting of the cutters and the putting on of the feed. The last may be effected by the wheel K running on a thread on the bar *a*, through slots in which it communicates with the bar I; or a lever P, Fig. 27, and scroll cam P<sup>1</sup> may be employed. Figs. 28 and 29 show the instrument adapted for cutting off long lengths from a tube. It is fixed on the outside of the tube, and the cutter C is fed by a helical groove in the wheel K<sup>2</sup> engaging the head *g*<sup>1</sup> of the wedge I. A friction roller *h*, Fig. 32, inclined to the axis of the tube, may by its rotation in contact with the tube advance the sleeve *i*, on which it is mounted, and the bar I in the direction of the axis of the tube; or, as in Fig. 33, the cut may be put on by a star-wheel *j* and screw *j*<sup>1</sup>, which are turned by a stop *k* attached to the tube Z. When attached to the tube plate Z<sup>1</sup>, Fig. 35, the instrument A is mounted upon an adjustable radial arm S. Fig. 41 shows the apparatus mounted upon a carriage U and

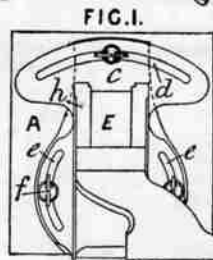


driven by a motor. The apparatus is adjustable in height, and the cutter is mounted upon a radial arm S<sup>2</sup>; a similar machine worked by hand is also described.

**3174. Mills, B. J. B.,** [*New England Vice Co.*] Dec. 3.



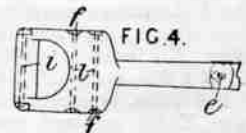
**Vices.**—A bench vice can be rotated on its bed-plate, and its jaws are formed so that they clear the projecting parts of the work. The plate *c*, carrying the fixed jaw C, is formed with a pivot pin *b* turning in a hole in the bed-plate A. The plate *c* is secured in any desired position by means



of studs *f* passing through curved slots *d*, *e*, *c*. The movable jaw D is formed with a hollow shank E sliding in guides *h* formed on the plate *c*. A screw F, formed with a neck turning in the jaw D, passes through a nut G secured to the plate *c*.

**3315. Nimmo, G.** Dec. 17.

**Handles.**—The D-shaped end of the handle of a spade or shovel is protected by plates *f* at the sides and is strengthened by rivets *i*. The stem is strengthened by the rivets, *e* which attach the strap of the blade, being formed with T-shaped heads bent to the shape of the handle.



## APPENDIX.

A.D. 1864.

1062. **Parnacott, E. J. W.** April 27.

*Saws, sharpening.*—Wheels for sharpening saws &c. are composed of emery, stone, grit, pounded clinker, litharge or white lead, burnt copperas, lampblack or ivory black, and other substances, mixed in stated quantities with gold size or "valata." The compound is pressed hydraulically

in a ring-shaped mould with a central core, between sheets of tin and moist paper on each face, the intensity of pressure depending on the hardness desired in the wheel. The moulds are dusted with blacklead to prevent adhesion of the pressed material. The wheels may be dried in iron moulds in a suitable stove at stated temperatures.



APPENDIX

A.D. 1884

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